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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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United Chemical Merchants

AN official announcement on another page states that, under the title of the British Chemical and Dyestuff Traders Association, a united organisation of merchants has been constructed out of the two associations previously in existence. Such an understanding had long seemed not only desirable from every point of view, but inevitable in the course of events. It was only a question of time, once the work of fusion had been seriously entered upon, and it has come perhaps sooner than might have been expected, as the result of negotiations which have been conducted quietly and with good judgment and good feeling on both sides, and in which the troublesome details, which are generally the chief difficulty in such matters, have been very tactfully arranged. The result will be received with general satisfaction, and all who have co-operated in bringing it about are entitled to congratulation. The new association appears to combine the best of both the old organisations, and in the important matter of *personnel* it starts on a representative and influential basis. Mr Victor Blagden is the president, Mr. F. T. T. Reynolds the vice-president, and Mr. Walter Waugh the treasurer. The executive consists of a group of London and provincial firms of first-rate standing, and Mr. Bromfield, who has worked hard from small beginnings to organise a merchant organisation, will serve as secretary. The new association dates officially from May 1.

The creation of one representative association of British chemical and dyestuff merchants marks an important addition to the chemical organisations of the country, and remedies a weakness from which the merchant interest has certainly suffered. The chemical manufacturers are already a powerful and well-organized body, capable of bringing their collective influence to bear with effect at any desired point. Chemical science of the pure order is provided for by the Chemical and other Societies. The professional interests of chemists are protected by such bodies as the Institute of Chemistry and the British Association of Chemists. Industrial and engineering chemistry is represented by the Society of Chemical Industry, the Chemical Engineering Group, and the new Institution of Chemical Engineers. The social side is being steadily developed by the Chemical Industry Club. Among all these bodies the merchant community will now have a recognized place, and will be entitled to be consulted on all matters of national policy affecting their interests, and to be represented on all joint authorities appointed to deal with them. The result cannot fail to be good. The manufacturing and the merchanting points of view may appear at points to be irreconcilable; but once the two interests begin officially to recognize each other and to exchange views, the points of difference will, at the least, be better defined and appreciated, and new points of agreement are sure to be discovered. The new association has a large field of useful service before it, and it starts with an excellent initial equipment.

Those who are entrusted with the management know their business too well to need outside advice, but without intrusion it may be permissible to offer two suggestions. The first is that the successful result of the negotiations might be signalised by an inaugural function of some kind—an opening dinner for example, —which would serve to bring the members together, and to let the public and the trade know something of the Association's aims and work. The second is that a series of periodical conferences on merchant problems might profitably be arranged. Scientific, technological, and engineering interests are being steadily advanced by the discussion of questions of common interest, and the remarkable success of the manufacturers' organisation is due largely to the pooling of opinions and experience. The argument of "trade secrets" is always available against any proposal for joint discussion; usually, however, there are very few real

"secrets" which are not quite well known to most competitors. Moreover, if anyone succeeds in "shutting in" his own information, it is at the expense of "shutting out" much more. Such conferences would serve not only to educate public opinion on merchant interests, but perhaps even more to educate trade opinion and to promote trade unity. During recent years so much of our legislation and departmental administration has borne directly on the business of merchants that there would be an embarrassing choice of practical and profitable subjects for treatment.

Materials for Equipment Construction

In a series of articles in *Chemical and Metallurgical Engineering*, various writers have recently reviewed the different materials which may be used in the construction of chemical plant, and bring out points which, though hardly new, are well worth attention. In the use of wood for pipes and tanks, for example, the first consideration is sound workmanship and the second the need for thoroughly seasoned wood. Wood pipes may not only be used for sulphite pulp, but they satisfactorily convey dilute sulphuric acid from benzol refining and oil refining and acid for galvanizing. For conveying CO_2 in white lead factories and for catch towers for hydrofluoric acid from acid phosphate manufacture they are found indispensable. A series of curves again is given showing that iron-silicon alloys are useless unless they contain at least 14 per cent. silicon, many alloys containing less than this amount being even more corroded than pure iron. A maximum carbon of 0·80 per cent. should also be insisted upon. Iron with 12 per cent. silicon is found to be corroded by dilute sulphuric acid ten times as much as one containing 14 per cent. silicon and about 30 times as much as one containing 15 per cent. silicon. The possibility of large containers to stand temperature being made with welded joints instead of riveted is discussed and it is shown that on a series of tests by the Bureau of Standards the welds were 80 per cent. of the strength of the original plate. The efficiency of riveted joints is also considered, various types having a strength of 50 per cent. to 93 per cent. of the original plates. A further article discusses the grounds on which metals for high temperatures must be selected. Two writers discuss the use of copper equipment, its advantages, and the limitations as to its use. An interesting column shows that some chromium-steels (stainless steel) are much more corroded by acids than pure iron. Others stand up much better to the usual reagents. Among the materials discussed is Aterite, an acid-resisting alloy, the composition of which is stated to be a nickel-brass, sufficiently strong and ductile to withstand rough treatment; this resists corrosion and withstands high temperatures. Entire valves can be made from it, for superheated steam, to withstand satisfactorily 250 lb. pressure and 1,250° F. An Aterite valve served at the bottom of an oil-refining agitator (conveying alternately strong sulphuric acid and dilute) for six years, where ordinary cast-iron cocks lasted only 42 days. This is worth the consideration of benzol refiners in this country. In considering the conditions of corrosion of brass and bronze it is interesting to note that tin or bronze must not be used in connection with ammonium nitrate explosives, as, although nothing is known of the reaction, the ignition point of these explosives is lowered. Among the uses to which aluminium is put, crystallising pans for ammonium sulphate are included, as the properties of aluminium would not suggest that it would stand up well to this work. A note on Monel metal states that its resistance to corrosion is due to its relatively low position in the electro-motive series and that as it forms no protective coating, it is especially adapted for use where it is subject to corrosion and abrasion combined. Enamel-lined apparatus is stated to be useful for concentrated acids when a special brown enamel is used. In discussing the properties of fused silica in radium production one writer notes that the breakage has decreased in replacing glass stirring rods by wooden ones. The dishes are heated directly over a gas flame, the support being a metal plate with a round opening.

Preservatives in Food

The recent wave of hot weather—as usual, of brief duration—has drawn attention again to the use of preservatives in foods. While the Ministry of Health is said to be carefully considering the question, it may be interesting to recall the fact that this matter was thoroughly considered 23 years ago by a departmental committee appointed by the Local Government Board. Its recommendations were that the use of formaldehyde or formalin in foods or drinks should be absolutely prohibited; that salicylic acid should not be used in greater quantity than 1 grain per pint or pound; that the use of any preservative whatever in milk should be constituted an offence under the Food and Drugs Acts; that the only preservative permitted in butter and margarine should be boric acid or borax not exceeding 0·5 per cent. expressed as boric acid; that the use of all chemical preservatives in foods intended for infants and invalids should be prohibited; and that the use of copper salts in the greening of vegetables should be prohibited. In 1907 the Local Government Board was given power under which it could practically carry out these recommendations. and, whatever the extent to which the power is used or unused, it would appear theoretically to be ample for the purpose.

Export of Nitrates

In a recent issue we quoted from an article by Professor Binz, of Berlin, on the world's chemical supplies, a statement in reference to nitrate exports from Scandinavia "that the Northern Hydro-Electric Nitrogen Company exported in 1921 17·3 million tons of sodium nitrate and 81·9 of calcium nitrate, against 14·8 and 46 million tons in 1916." The rather startling dimensions of the figures has attracted the attention of some of our readers, and a moment's reflection is sufficient to show them to be impossible. To put the matter beyond doubt we have inquired as to the official figures, and find that "million tons" should be "million kilograms"—probably an error in translation—but that otherwise the figures are correct. Another correspondent, to whom we are indebted for working out the amount in tons, gives them as 17,313 tons of sodium nitrate and 81,877 tons of nitrate of lime for 1921.

Town's Gas Free from CO

DURING the early part of the week the daily newspapers gave considerable attention to a new invention which, it was stated, is going to end the gas poison peril. Details of the new process are not yet available, but one authority tells us that, after three years' experimenting, Mr. C. B. Tully, a well-known inventor and gas engineer of Newark-on-Trent, has succeeded in reducing the amount of carbon monoxide in household gas from the usual percentage of 12 to the negligible quantity of 0·4 per cent. Probably by next week further information may be available which will enable a definite opinion to be formed. Meanwhile the announcement recalls a patent issued towards the end of last year. This relates to the manufacture of hydrogen by a process of completely gasifying bituminous coals, and the process is carried out in apparatus very similar in construction to the gas plants already designed by Mr. Tully. In this patent the fuel bed temperature and travel of gas are so regulated as to favour in their final result the oxidation of the carbon to carbon dioxide instead of to carbon monoxide, so that "the gases obtained contain a relatively high proportion of carbon dioxide." Moreover, the water gas reaction which is principally aimed at, in substitution for that in which carbon monoxide is produced, is the reaction to carbon dioxide according to the equation :—

$$C+2H_2O=CO_2+2H_2$$

a reaction which, by regulating steam flow, the gas manufacturer at present does his best to avoid and to produce the alternative result, namely,

$$C+H_2O=CO+H_2.$$

Some idea of the principle involved may probably be gathered from a specification (No. 195,798) which appears in our Patent Literature on page 519 of this issue.

The Cambridge Meetings

THE official programme just issued by the Society of Chemical Industry, of the annual meetings to be held at Cambridge on Wednesday, June 20, to Saturday, June 23, is of an attractively social and holiday character. On the Thursday morning, those who have survived the effects of the previous evening's "smoker" will be welcomed by the vice-chancellor (Dr. Pearce); the annual general meeting, with the address of Dr. Armstrong (president) will follow, and afterwards there will be visits to gardens and colleges, a reception at five o'clock by the vice-chancellor and another in the evening by Dr. and Mrs. Armstrong. On Friday morning, Dr. Carpenter, after the presentation to him of the Society's medal, will deliver an address; in the afternoon Dr. F. W. Aston will give an address on "Isotopes," and the annual dinner will be held in the evening. Saturday will be occupied by a trip to Ely Cathedral. For these fixtures the Society has adopted the policy of a fixed inclusive charge, depriving the visiting member of the old privilege of merely paying for what he wanted. Accommodation is being arranged at the colleges and in hotels, and "hospitality" is also offered to those who prefer it.

With respect to the officers for the coming year, Dr. E. F. Armstrong has been nominated for re-election as president—a decision that will be generally approved. Dr. T. Howard Butler, Mr. F. H. Carr, Professor G. G. Henderson, and Mr. Emile Mond have been nominated vice-presidents. Mr. E. V. Evans has been re-elected honorary treasurer, and Sir William Pope has been elected honorary foreign secretary.

Points from Our News Pages

Mr. J. A. Reavell contributes an article on "The Leaching of Tannin Materials" (p. 506).

A report is published on the proceedings at the Annual Meeting of the Chemical Engineering Group of the Society of Chemical Industry (p. 509).

Meetings of the London and Manchester Sections of the Society of Chemical Industry were held last week (p. 510).

At the Institution of Petroleum Technologists on Tuesday, Professor Brame read a paper describing the chemical nature of Egyptian oil, investigated by Mr. W. A. Guthrie, F.I.C. (p. 512).

Dr. Kruyt of Utrecht University lectured at University College, London, on the "Electric Charge on Colloids" last Tuesday (p. 513).

An improvement in the demand for chemicals is reported in our London Market Report, which also states that Germany as a supplier has practically disappeared from the market (p. 521).

Business in the Scottish Chemical Market remains quiet, with fair inquiry, according to our special market report (p. 524)

Books Received

SYNTHETIC INORGANIC CHEMISTRY. By Arthur A. Blanchard and Joseph W. Phelan. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. Pp. 321. 15s.

THERMODYNAMICS AND THE FREE ENERGY OF CHEMICAL SUBSTANCES. By Gilbert Newton Lewis and Merle Randall. London: McGraw-Hill Publishing Co., Ltd. Pp. 653.

The Calendar

May 14	Institution of Rubber Industry: "The Scope and Progress of the Research Association." B. D. Porritt.	Manchester.
16	Society of Glass Technology: General Meeting. 12 noon.	Physical Chemistry Theatre, University College, Gower Street, W.C.1.
16	Society of Glass Technology: Annual Dinner. 7 p.m.	Hotel Cecil, Strand, London, W.C.2.
16	Oil and Colour Chemists' Association: Annual Dinner. 7.45 p.m.	Holborn Restaurant, London, W.C.1.
17	Royal Society: Papers by A. E. H. Tutton, Professor L. N. G. Filon, and F. C. Harris. 4.30 p.m.	Burlington House, Piccadilly, W.1.
17	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, W.1.
22	Northern Polytechnic Institute Chemical Association: "The Acceleration of Vulcanisation." P. Schidrowitz. 8 p.m.	Holloway, London, N.

The Leaching of Tannin Materials

Notes on the Thornycroft Patent Leaching Apparatus

The following notes on the Thornycroft Patent Leaching Apparatus are supplied by Mr. J. Arthur Reavell, M.I.Mech.E., M.I.Chem.E. (of the Kestner Evaporator and Engineering Co., Ltd., London, and Chairman of the Chemical Engineering Group) and will be appreciated by numbers anxious to obtain information about the process

THE problem of leaching barks, nuts and wood for the extraction of tannin and dye materials is one of growing importance.

When it is borne in mind that thousands of tons of materials are daily passed through leaching plants for the purpose of extracting the soluble dyes or tan extracts, it is obvious that any improvement in this industry, whereby a greater extraction of the soluble material can be obtained at a lower cost, is of the utmost importance to the manufacturers of tan extract and makers of dye products.

Broadly speaking, there are two outstanding features that must always be borne in mind in dealing with this problem:

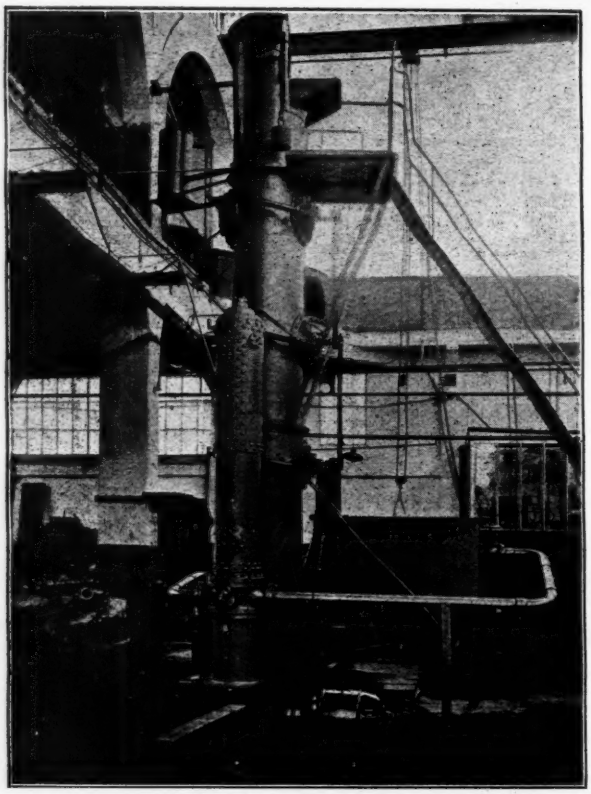

FIG. 1.—VIEW OF THORNYCROFT PATENT LEACHING PLANT, AS ERECTED IN MAKER'S WORKS BEFORE DESPATCH.

One is the removal of the maximum amount of soluble matter at a minimum cost, and the other is the delivery of the raw material to the plant and removal of spent material.

In an industry of this kind, which has been carried on for so many years, it seems impossible to break away from stereotyped methods. It is refreshing, therefore, to find that a new method has been adopted recently for use in this industry which approaches the problem on entirely new lines.

The Thornycroft patent leaching apparatus is not only an ingenious apparatus carefully thought out in every detail, but it is evident that it has been approached on sound mechanical lines, such as one would expect from so eminent an engineer as Sir John Thornycroft.

The general idea of the plant is best obtained by reference to Fig. 1. This photograph shows a complete installation as erected in the shops prior to despatch. It will be seen that the plant consists of a vertical tower, constructed of copper and having near the base a tank into which is fed the material to be leached. In front of the tower is a heater, which is used for heating the liquor in the leach during concentration.

Fig. 2 gives a sectional view of the leach. It will be noticed that there is a spindle or shaft which passes down the centre of the tower, and at given distances down the length of this

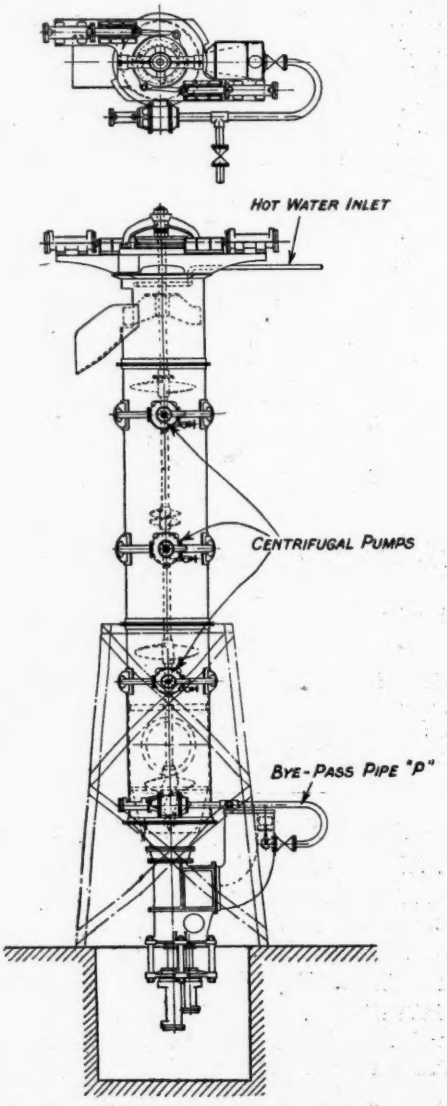

FIG. 2.—THORNYCROFT PATENT LEACH.

spindle are screws or propellers arranged so that when the spindle rotates the whole mass in the tower is raised. In order to indicate very clearly this method of operation, Fig. 3 shows in section the lower end of the tower. The bark to be leached is delivered into the feed box X which corresponds to the tank shown in Fig. 1. In this tank there is kept a constant supply of liquor, which is led from the tower itself through pipe P, Fig. 2, and consists of the leaching water, which has already passed through the column of bark in the tower. The bark is thus thoroughly wetted by means of this tan liquor, before it enters into the tower itself.

Immediately beneath the tower is a cylinder with an hydraulically operated piston, and between the feed box X and this cylinder is a valve. A valve is also placed between the tower and the cylinder.

Assuming that the material is in the position shown on the drawing, with the valve also as indicated, the following is the method of operation :—

Valve B connecting the cylinder with the tower is opened. The main piston C is at the bottom of its stroke, having just received a charge of fresh bark from the feed tank X through the valve A. The piston moves upwards and, at the same time, the vertical screw Y is automatically turned so as to raise the whole column of material in the tower. In this way the new charge of bark is delivered up into the tower and, at the same time, a charge of spent bark is removed from the top of the tower, as will subsequently be described.

The next movement is for the valve B to close. The piston C is drawn down and the slide valve A opened ready to charge the cylinder anew with the fresh material.

In the upper portion of the tower, as indicated on Fig. 4, is shown the mechanism for discharging the spent material, and for operating the central shaft.

At the top of the tower is a horizontal ram, coupled to a gear with ratchet, which is connected to the central shaft. At the

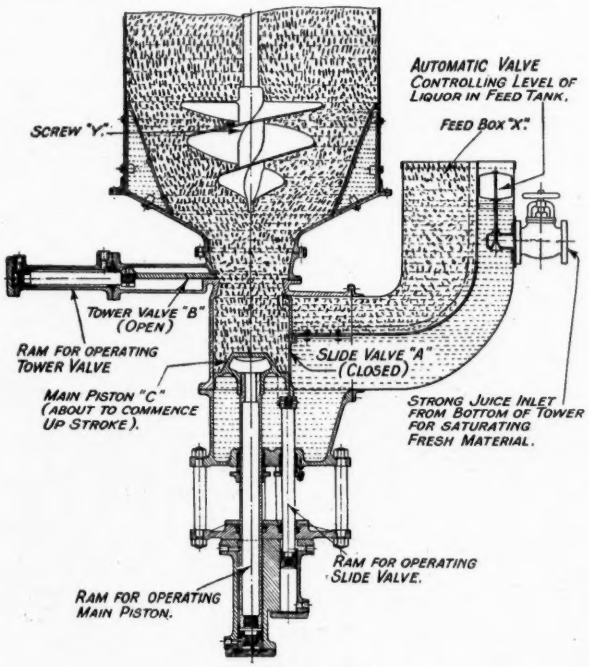
AUTOMATIC VALVE CONTROLLING LEVEL OF LIQUOR IN FEED TANK.
SCREW "Y".
FEED BOX "X".
TOWER VALVE "B" (OPEN)
RAM FOR OPERATING TOWER VALVE
SLIDE VALVE "A" (CLOSED)
MAIN PISTON "C" (ABOUT TO COMMENCE UP STROKE).
STRONG JUICE INLET FROM BOTTOM OF TOWER FOR SATURATING FRESH MATERIAL.
RAM FOR OPERATING SLIDE VALVE.
RAM FOR OPERATING MAIN PISTON.

FIG. 3.—SECTION THROUGH LOWER END OF THORNYCROFT LEACH.

desired moment this ram is operated, thus giving the circular movement to the centre shaft, which operates the propellers and gives the material its upward movement.

Each time this operation takes place the sweeper arms attached to the centre shaft carry forward the spent material that is accumulated and deliver it into the discharge chute.

Although the description of this mechanism may, at first, seem complicated, it will at least show that each operation is carefully controlled, that is, the fresh charge of material is put in wet, which is essential to good leaching. Also, at the given moment, this is discharged into the tower, and the screw blades operate, carrying forward the material towards the discharge, while at the same time the sweeping operation comes into play and removes the spent material.

The water which is used for leaching is delivered into the top of the tower and travels downwards counter-current to the material.

The reason why the operation of this plant is so simple is that the inventor has a most ingenious method of operating and of controlling these valves. This consists of very simple control gear which is timed so that at definite periods the whole of the valves, which are moved hydraulically, operate absolutely at the right moment (see Fig. 5).

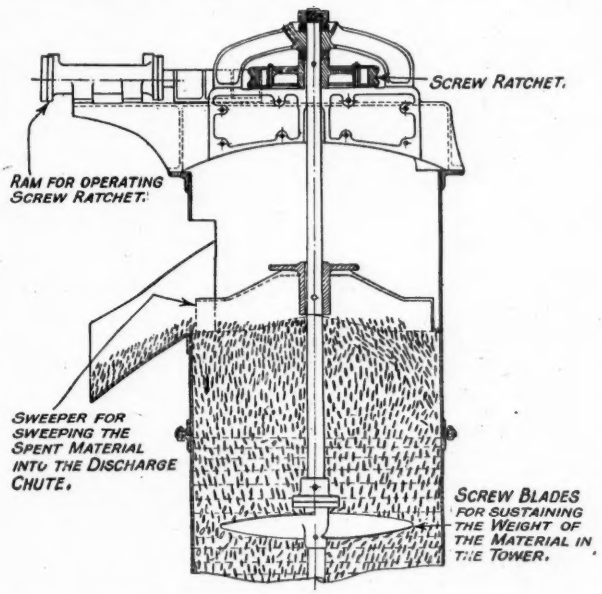
SCREW RATCHET.
RAM FOR OPERATING SCREW RATCHET.
SWEEPER FOR SWEEPING THE SPENT MATERIAL INTO THE DISCHARGE CHUTE.
SCREW BLADES FOR SUSTAINING THE WEIGHT OF THE MATERIAL IN THE TOWER.

FIG. 4.—SECTION THROUGH TOP END OF THORNCYROFT LEACH

In watching such a plant at work it gives an almost uncanny feeling to see the precision with which each part functions at its appointed time.

The horse-power required to operate the installation is very small. Labour is reduced to merely supervision, so that, even from the mechanical point of view, the apparatus requires very little attention. In fact, one man could quite easily operate a battery of ten or twelve of these machines.

The material can be fed into the hopper mechanically and the spent material is discharged at a head of some thirty feet above ground level, thus being easily delivered direct to the boiler room, where in every well regulated works it is used for fuel.

Now, while the mechanical operation may be perfect, and the labour-saving advantages so great, the apparatus would be

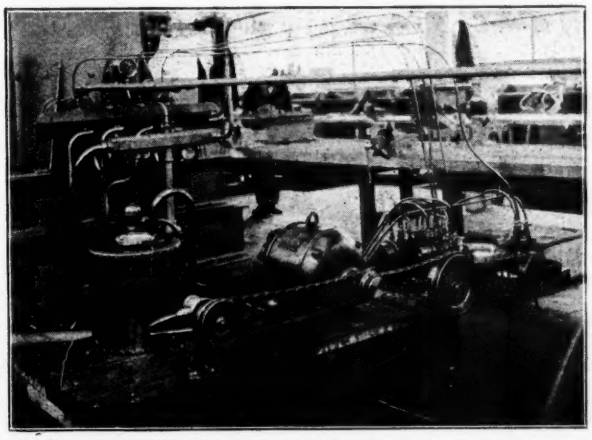

FIG. 5.—VIEW OF THE TIMING GEAR FOR AUTOMATIC OPERATION OF THE VALVES IN THE THORNYCROFT LEACH.

useless unless it fulfilled its true functions. It is not only necessary in true leaching to work counter-current, but it is necessary to heat the leach liquor so as to obtain a maximum

temperature when the tan is nearly spent and a minimum temperature for the raw material.

It is also necessary to get sufficient relative movement between the liquid and the material to be extracted. All this is done by a very simple but effective method of cross-circulation in the tower.

The liquid is not only moving downwards and the material upwards, but there are arranged a series of three or more centrifugal pumps which circulate cross-wise on the tower. Consequently, there is, as well as a vertical current, a cross-current of liquor, which makes a most effective method of obtaining the maximum extraction. In order to prevent troubles due to blockage of the sieve, which is likely to take place on the suction to the centrifugal, there is an arrangement whereby, for a certain period, the discharge is from right to left and then from left to right. By means of this reversal arrangement, the tendency for blockage on the pumps is avoided, which is a very important feature when dealing with certain barks and nuts which offer considerable difficulties in this direction.

The arrangement of this cross-current, by means of simple centrifugal pumps, also solves the problem of heating, because by the use of small calorifiers, which are fitted on the delivery of these pumps, the liquor can be kept at any pre-determined temperature in any portion of the tower. Thus, when working with, say, three sets of centrifugals, it is possible to work with a maximum temperature of, say, 100° C. (212° Fah.) in the top portion of the tower just before the spent material leaves, and regulate the temperature down to, say, 40° C. (104° Fah.) at the bottom of the tower, where the liquor is discharged.

It is a simple matter to regulate these temperatures to suit the different products to be dealt with.

J. Arthur Reavell.

British Chemical and Dyestuff Traders

A United and Representative Organisation

We are officially informed that a fusion of the British Chemical Trade Association and the Chemical and Dyestuffs Traders' Association has been effected. The chairman and executive of the united organisation—the British Chemical and Dyestuffs Traders' Association—have great pleasure in making this announcement. The fusion dates from May 1, 1923. The officers of the new body are the following :—

Chairman.—Mr. Victor Blagden (Victor Blagden and Co., Ltd., London).

Vice-Chairman.—Mr. Fredk. T. T. Reynolds (Millwards Merchandise, Ltd., Manchester).

Hon. Treasurer.—Mr. Walter Waugh (Walter Waugh and Co., London).

Executive Committee.—Mr. H. A. Berens (Old Strand Chemical and Trading Co., Ltd., London); Mr. A. F. Butler (R. W. Greeff and Co., Ltd., London); Mr. A. Connell (A. Connell and Co., London); Mr. H. Gilliat (E. G. Jepson and Co., Leeds); Mr. G. A. Hamilton (A. and M. Zimmermann, Ltd., London); Mr. T. Henderson (T. Henderson and Co., Ltd., Glasgow); Mr. S. J. C. Mason (Bush, Beach and Gent, Ltd., London); Mr. Chas. Page (Chas. Page and Co., Ltd., London); Mr. H. S. Willcocks (H. S. Willcocks and Co. (Chemicals), Ltd., Manchester).

The Secretary is Mr. O. F. C. Bromfield. The offices will be at 80, Fenchurch Street, E.C.3, and the telephone number is "Avenue 7347."

Reparation Dyestuffs

The Board of Trade draws attention to the fact that, under the Reparation Clauses of the Peace Treaty, requisitions are made periodically for the delivery of certain German dyestuffs on reparation account. Information as to the requirements of colour users for dyestuffs which cannot be obtained from British manufacturers is collected by the Colour Users' Association and furnished periodically to the Board of Trade. In order that this information may be as complete as possible, the Board would be glad if all users—whether members of the Association or not—would furnish particulars of their estimated requirements for German dyestuffs, say once every three months, to the Secretary, Colour Users' Association, Cromwell Buildings, Blackfriars Street, Manchester.

Society of Public Analysts

At an ordinary meeting held at the Chemical Society's Rooms, Burlington House, on Wednesday, May 2, 1923, Mr. P. A. Ellis Richard, president, in the chair, a certificate was read for the second time in favour of Mr. Robert C. Grimwood, A.C.G.F.C., D.I.C., A.I.C. and the following were elected Members: Messrs. John Myers, F.I.C., and John Loudon Buchanan, F.I.C.

Abstracts of Papers

"The quantitative determination of hemp and wood in papers containing these two fibres," was dealt with in a paper by Mr. William Dickson, F.I.C. The author considered that in the microscopical determination of hemp fibres in the presence of wood, examination alternately by ordinary and polarised light enabled one readily to distinguish the micro-structure of the different fibres. He had devised a method for quantitative work, utilising the counting method of Spence and Krauss (*World's Paper Trade Review*, December 18, 1917). The paper was disintegrated by boiling with dilute caustic soda and the pulp churned up with an egg switch. The fibre was then stained by Cross and Bevan's double malachite green and congo red method, well spread out on the cover slip and mounted in the usual way. The counting was done by Spence and Krauss's method, but no correction factor was required to convert proportions by diameter into proportions by dry weight of furnish.

Mr. H. Jephcott, M.Sc., F.I.C., in a paper on "The estimation of fat, lactose and moisture in dried milks," concluded as a result of examining over 25,000 samples of dried milk that :—(1) Moisture was best determined by drying at 102–103° C. for 1 to 2 hours. (2) Fat could most satisfactorily be determined by drying by a careful use of the Werner-Schmidt method. A modified Gerber method gave less accurate but concordant results for rough routine purposes. (3) The polarimetric determination of lactose in milk powders, whilst offering certain advantages, should not be used where great accuracy was desired. In such cases a gravimetric process, based upon the modified Fehling's method of Quisumbing and Thomas was recommended.

In a paper on "The determination of lactose by the polarimetric and gravimetric method," Mr. A. L. Bacharach, B.A., A.I.C., pointed out that pure α-lactose mono-hydrate was prepared by careful recrystallisation and drying. It was shown to have the value for $[\alpha]_D^{20}$ of 52·42, agreeing with the most trustworthy recorded figure. The specific rotation of pure α-lactose monohydrate for the green line of the mercury vapour arc was shown to be represented by the equation :—

$$[a]^{t}_{\lambda=541}\ (c=5) = 61{\cdot}94 + (20 - t)\ 0{\cdot}085.$$

Dealing with "The melting point and iodine value of refined natural d-camphor," Mr. Maurice S. Salmon, B.Sc., showed that the iodine value and melting point of specially purified d-camphor have been re-determined, that the usually accepted value was too high, and that the usually published melting point was too low. The iodine value of the specially refined d-camphor was found to be 0·λ, and the melting point 179° C. It was concluded that the majority of previous determinations must have been made on d-camphor that was slightly impure. The iodine value of oil of camphor had also been re-determined, and samples were given of how this value together with the melting point and iodine value of d-camphor could be used to indicate the percentage of camphor present in a sample of refined d-camphor. This suggested that refined d-camphor for pharmaceutical purposes should have a melting point not lower than 176° C, and an iodine value of not more than 0·7.

Mr. A. G. Francis, B.Sc., F.I.C., in a paper on "The presence of barium and strontium in natural brines," gave the results of the analysis of seven samples of brines from deep boreholes in Derbyshire, Staffordshire and Scotland, together with a brief account of the method of analysis adopted. The maximum quantities of barium and strontium chlorides found were 178·2 and 169·4 parts per 100,000 respectively. An explanation based upon the "permutit" reaction was put forward to account for the presence of the chlorides of barium and strontium in natural brines, and it was shown that there was a gradation in the strengths of sodium chloride solutions necessary completely to remove calcium, strontium and barium from a "permutit" filter charged with these elements.

Chemical Engineering Group

Annual Meeting and Dinner

THE fourth annual meeting and dinner of the Engineering Group of the Society of Chemical Industry was held at the Engineers' Club, London, on Friday, May 4, Mr. J. Arthur Reavell, chairman of the Group, presiding.

Report for the Year

The HON. SECRETARY (Mr. H. Talbot), in his report for the year, stated that the work of the Committee had consisted mainly in strengthening the organisation, particularly in reference to its relations with the parent Society, in an endeavour to secure its continued well-being, rather than in active propaganda work of the nature of meetings, conferences, and the like. This course was dictated largely by financial reasons, owing to a deficit on the previous year's working which, unfortunately, had persisted during the year now under review. The Data Sheet Committee had continued its labours which had temporarily been held up owing to lack of funds. During the past year two data sheets, denominated respectively "The Properties of Tan Extract Liquors" and "Condensation Curves for Hydrochloric Acid," were issued, owing to the receipt of a special grant of £100 from the Messel Memorial Fund in the hands of the Society. Special thanks were accorded to the Hon. Treasurer (Mr. F. H. Rogers) for securing this grant. After expressing regret at the resignation from the Group Committee of Dr. H. J. Bush, who assisted at the inauguration of the Group and had done extremely valuable work on the Group Committee ever since, reference was made to the relations between the Group and the parent Society, which had continued to be the subject of much negotiation and discussion during the past year, following the preliminary agreement arrived at and reported to the last annual general meeting.

"In this connection," the Hon. Secretary said, "it is impossible to overrate the services rendered to the Group by the Chairman (Mr. J. A. Reavell), and the Hon. Treasurer (Mr. F. H. Rogers) on the one hand, and by Dr. Armstrong (President of the Society), and Mr. E. V. Evans (Hon. Treasurer of the Society) on the other. As a result, the feeling between the two bodies has never been more cordial and, as evidence of this, the group has been entrusted with the whole of the organisation of the Chemical Section of the World Power Conference to take place on the occasion of the opening of the British Empire Exhibition at Wembley during 1924. Similarly, the relations between the Group and the Institution of Chemical Engineers is naturally of an extremely close character and joint offices are now shared at Abbey House, Westminster. The future position as between the two bodies is still the subject of negotiations between sub-committees appointed on either side, and the Group Committee feels that in everybody's interests the two organisations cannot be too closely allied.

References were made to the various meetings held during the year, and regret expressed that the membership of the Group had declined from 401 to 315 at the end of the past year, but at the present moment the latter number had been considerably increased. As a result of the falling off in membership during the year the revenue of the Group naturally suffered, but the Society had generously agreed to meet the deficiency on the past two years amounting in all to £173, and special thanks were accorded to the Society for its generosity. At the beginning of 1922, an American Section of the Group was inaugurated, which continued in existence, although it was possible that the organisation initially developed for its work would have to be revised, in view of the new relations between the Group and the Society. As one consequence of the formation of the American Section, the Committee were pleased to be able to nominate Dr. Ruttan, a past President of the Society, the first honorary member of the Group, a compliment which Dr. Ruttan had been pleased to accept. Summing up, the Committee of the Group felt that the past year had resulted in a very definite increase in the Group's stability, and it was anticipated that with the financial arrangements now made, the Group would be able to do much more useful work in the future than had been possible in the past.

The report was adopted without discussion.

Treasurer's Report

Mr. F. H. ROGERS (Hon. Treasurer), in the course of his report, said he did not think the falling off in membership during the past year was due to lack of interest in the work of the Group but was due simply to the trade slump which had characterised practically every industry throughout the country. As had already been stated, however, there had been a considerable improvement since the end of last year. The arrangements by which the parent Society now collected the subscriptions of the members of the Group had resulted in bringing in more members for the Group, and, altogether, the position now was more satisfactory, and the Group started the current year absolutely free of debt, thanks to the kindness of the Society, as already mentioned by Mr. Talbot. There had been some discussion during the year as to whether an appeal should be made to the members of the Group for donations, but it had been thought wise not to do that. Had such an appeal been made he was sure it would have met with a very good response. After discussion with the parent Society, the arrangement already referred to, whereby the deficit was borne by the Society, was come to. He echoed what Mr. Talbot had said as to what the Group owed to the Chairman in bringing about this result.

The Hon. Treasurer's report and the balance sheet were then adopted.

New Rules

New rules for the Group were adopted; these consisting of certain modifications of the existing rules, which were based on those relating to the London Section, the working of which, it had been found, was slightly different from the working of the Group. The new rules were adopted and are subject to confirmation by the Council of the Society.

Elections and Votes of Thanks

With regard to members of Council for the coming year, the Hon. Secretary reported that there there had been no nominations, and in the circumstances he suggested that the existing members of Council should be re-elected for another year.

This course was agreed to and the present chairman (Mr. J. A. Reavell), the hon treasurer (Mr. F. H. Rogers) and the hon. secretary (Mr. H. Talbot) were also re-elected.

On the motion of Mr. Rogers, a hearty vote of thanks was accorded to the parent Society, special reference being made to Mr. E. V. Evans, the hon. treasurer of the parent Society, for the manner in which he had supported the Group in regard to financial assistance.

Professor J. H. HINCHLEY, proposing a vote of thanks to the Chairman, Hon. Treasurer and Hon. Secretary, said that only those who were behind the scenes knew the amount of work actually done by these three gentlemen. He felt that the Group was now fundamentally soundly established, and it was largely due to the work of their Chairman, Hon. Treasurer and Hon. Secretary that this position had been reached.

The only toast at the subsequent dinner was "The King," the rest of the evening being spent in listening to an interesting musical programme in which Messrs. H. Child, Gibson Grange, A. H. Gee, and K. Knight took part.

Modern Atomic Theories

PROFESSOR FREDERICK SODDY, lecturing on Friday, May 4, at the Royal Institution, London, on "The Origins of the Conception of Isotopes," said that he felt justified in stating that the lifetime labours of the chemists, who since the time of Stas had devoted themselves to the exact determination of atomic weight, appeared to have as little theoretical interest now as if you sought to determine the average weight of a collection of beer-bottles, all exactly alike, but all not quite full. For generations it had distressed chemists that it was impossible to arrange elements so that they should be multiples of a unit (say) 1, 2, 3, 4, 5, 6, and so forth. They were very nearly so, but their weights always came out as (say) 1, 2·03, 3·07, 4·01, etc., never perfectly symmetrical. The difficulty vanished with the conception of isotopes in which the elemental atoms were regarded as atoms that varied within a certain limit, so that we were only getting average weights. Professor Soddy considered that the atom (with its external shell) continued to behave chemically as an atom so long as the excess number of positive over negative charges in the nucleus remained the same, even though there might be a difference in the numbers of positive and negative charges counted separately. In view of the latest experiments, it would be absurd to look for an absolute atomic weight.

Society of Chemical Industry

Reports are given below of a number of papers contributed to the last meetings of the London and Manchester Sections of the Society of Chemical Industry.

Annual Meeting of the London Section

THE annual meeting of the London Section of the Society of Chemical Industry was held at the Engineers' Club, London, on Monday, Mr. E. V. Evans presiding.

Work of the Past Session

In reporting on the work of the past session, the CHAIRMAN referred with satisfaction to the fact that Dr. Bernard Dyer had accepted office as Chairman of the Section, and that Dr. Monier-Williams had agreed to continue as hon. treasurer and secretary. Commenting on the change of place of meeting during the present session from Burlington House to the Engineers' Club, the Chairman mentioned that there was not an absolutely unanimous agreement on the change, although he believed the change generally had been appreciated. That the change was not agreed to unanimously was shown by the following reply received that morning from a very eminent chemist: "I am just home; thanks for your invitation, but I cannot stand the insanitary and forbidding conditions under which you meet." Another matter mentioned by the Chairman was that the Committee of the Section felt that more papers should be offered to the Section. There were 1,400 members of the Section, and he had been surprised during his term of office at the difficulty which the Secretary often had in getting good papers.

The following were elected to fill vacancies on the Committee: Dr. J. P. Longstaffe, Dr. E. H. Tripp, Dr. L. A. Jordan and Mr. R. A. Punter.

It was announced that at the next meeting of the Section, Dr. Hele-Shaw would describe and demonstrate his new filter and that the meeting would be held in the Chemical Society's rooms at Burlington House.

Action of Bacteria on Cellulosic Material

Opening a discussion on this subject, SIR FREDERIC NATHAN said that the action of bacteria on cellulosic materials, using both terms in their widest sense, might conveniently be considered as proceeding either naturally or artificially. In the case of the action taking place naturally, the effects might be either harmful or beneficial, and as regards beneficial action first place must be given to coal. The theory was that coal was in a great measure derived from the original plant cellulose, which had been subjected to bacterial action with the formation of ulmic substances. Fischer and Schrader had very strongly contended, within the last year or two, that the action of bacteria on vegetable matter resulted in the breakdown of the cellulose, with the production of carbonic acid and water, the lignin of the vegetable matter being transformed by other influences into ulmic substances and ultimately into coal. Further information on this matter would be of great interest. Turning to the natural effects of a harmful character, he said that the destruction of cellulose for the production of fabrics was a matter of very great importance. His attention was first directed to this matter in 1906 when on a visit to India in connection with three cordite explosions. Whilst at the Government cordite factory in the Nilgiris he was shown the cotton waste obtained from England for the manufacture of guncotton and which had undergone serious disintegration. The cause was attributed to the climate. In 1917 supplies of cotton waste and cotton linters which had been stored under adverse conditions were found to have undergone similar disintegration. After investigation, the conclusion was arrived at that under certain conditions of temperature and moisture, bacterial action was set up, and, further, that cottons grown in different parts of the world were decomposed at different rates. This fact, if definitely established, might have far-reaching application. These investigations were still proceeding, and it was hoped that means would be found for preventing or restricting this serious loss of such a staple article.

Reference was next made to the experiments at Rothamsted upon the production of artificial farmyard manure, and to the fact that patents have been taken out recently covering the production of acetic acid and alcohol from vegetable materials, of little or no value for other purposes, by direct bacterial fermentation; marsh gas, hydrogen, and carbonic acid were also obtained as by-products. Details, however, were lacking as to the yields of the various products and as to the conditions under which they were respectively produced. Again, experiments were being carried out Nobel's explosive factory in Ayrshire upon the fermentation of cotton waste into practically nothing but methane and carbonic acid. The work was in its initial stage, but it offered possibilities in connection with the production of formaldehyde and methyl alcohol. The subject of the conversion of waste vegetable materials into power gas had been studied at the Indian Institute of Science, Bangalore, and a good deal of work was in hand in connection with bacterial action upon flax and other fibres, there being evidence that the rate of destruction of flax was influenced by whether the material has been tank or dew rotted.

Finally, reference was made to the attempts to produce alcohol from vegetable and other growths. Up to the present it could not be said that any micro-organisms had been found that would attack cellulosic materials to produce alcohol directly and in such a way as to point to a successful commercial application. There had been some advances recently in connection with the production of alcohol from semi-tropical grasses, and from sawdust and wood waste, which were not, however, the result of direct bacterial action. In the case of grasses, the method of subjecting them to acid hydrolysis had been worked out and gave good results, and as regards sawdust and wood waste, a process had reached a technical scale application, both in France and Germany, in which the material was subjected to the action of strong hydrochloric acid, both liquid and gaseous, in plant of special material and construction. The yield of alcohol from the fermentation of the resulting carbohydrates was stated to be at least three times as great as that obtained by the older processes of Clason and others.

An Account of Researches

MR. ARTHUR H. LYMM followed with a detailed paper on researches by Mr. Herbert Langwell and himself upon the fermentation of cellulosic materials for the production of a light motor fuel, the aim being to use waste materials, in contradistinction to those materials which were to-day mostly used as the raw material for aclohol fermentation—viz., materials which had a food or fodder value. Waste materials, said Mr. Lymm, must be the basis of such an industry if it was to be commercially sound. As instances of the materials he had in mind, he mentioned maize waste and the various straws and grasses to be found to the extent of many millions of tons in the tropics. Hitherto no process had been developed for transforming cellulose directly into useful organic products—among the most important of which were alcohol and fatty acids—without the intervention of considerable quantities of relatively expensive chemicals, and most of the early work consisted of laboratory experiments. The work dealt with by Mr. Langwell and himself, however, was on a large scale, and was partly embodied in British patents 134,265 of 1918 and 161,294 of 1920, and four further patent applications were on file.

It was in view of the uncertainty of the products obtained by the anærobic fermentation of cellulose that the investigations referred to were undertaken; first on a laboratory scale and later on a very much larger scale, embodying cultures up to 8,000 litres in volume. The early investigations were concerned chiefly with the organisms to be employed, and as a result a bacillus was found which would rapidly attack almost every form of cellulose under either anærobic or ærobic conditions. It was found, however, that lignocelluloses (wood and jute) and cuto-cellulose (cork) were only attacked with extreme slowness, if at all, unless the cellulose was first freed from combination. With these exceptions almost every form of carbodydrate (including starches and sugars) yielded to the attack of the bacillus.

Cellulose-destroying organisms had, Mr. Lymm said, so far been rather inadequately described by investigators and the paper therefore went on to describe work which showed that a certain bacillus was the chief, if not the only, organism con-

cerned in the general anærobic fermentation of cellulose according to the process which had been worked out by Mr. Langwell and himself. Results were given of cultures on standard media at 38° C. and gelatine media at 20° C., and it was found that two distinct types of colony were almost invariably obtained: (*a*) flat, round, semi-transparent, with a tendency to spread and having a yellowish colour and moist appearance. This developed more slowly than (*b*), which was flat, irregular in outline, and opaque white with crenate edges. It had a ringed structure due to variations in opacity. The large colonies remained clearer in the centre than at the edge, whilst small colonies were almost uniform in opacity. Only the agar media gave very satisfactory results. The presence of a carbohydrate assisted developement very materially, while the presence of bouillon or oeptane enabled growth to take place under ærobic conditions. Media without a carbohydrate, such as nutrient agar, only permitted of the development of small colonies. On the other hand, media without organic nitrogen, but containing carbohydrates, gave good development in deep cultures where the conditions were almost anærobic.

Further experiments to differentiate between the two kinds of colony showed it probable that they were only two forms of the same organism. A large variety of carbohydrates were experimented upon and they appeared to behave similarly and to yield similar products to the typical cellulose adopted as standards—filter paper in the laboratory tests and sulphite pulp in the large cultures. The rate of fermentation was also satisfactory and varied from 24 hours for the sugars to about 5 days for the resistant celluloses.

The paper contained tables of results, and it was stated that the products obtained could be varied, on the small scale, by varying the conditions of fermentation, without any change of organism. In practice fermentation was carried on at 68° C, a temperature which automatically purified the culture and kept it free from outside contamination. The paper dealt only with cellulose. Almost all vegetation contained at least 50 per cent. of cellulose or other carbohydrate, and it was only necessary to know the amount of fermentable carbohydrate in any substance to obtain a good idea of the possible yield of products from such a raw material by the process which had been described.

The conclusions were: (1) That an active cellulose culture had been placed under pure culture conditions and a single colony used to start another cellulose culture; (2) that in these investigations a single organism was responsible for the anærobic fermentation of cellulose, and it did not appear that this organism was similar in its behaviour on standard media to any species known to the authors; (3) that the organism might quite satisfactorily be cultivated at any temperatures from 37° to 65°, the former being most suitable for pure culture work, while the latter appeared to be the optimum temperature.

Discussion

DR. TYSON, of the Royal Naval Cordite Factory, said that in 1922 Pringsheim carried out some very interesting work with the theremophilic bacteria in which he showed that by arresting the growth of these bacteria by the addition of suitable antiseptics or by increased temperatures he was able to accumulate glucose and particularly cellobiose from the decomposing cellulose. The breakdown thus appeared to follow lines parallel to those already known from the chemical hydrolysis of cellulose and a further study of the bacterial decomposition of pure cellulose would materially assist in the elucidation of the cellulose molecule.

DR. PAGE (Rothamsted) described the experiments on the production of artificial farmyard manure at Rothamsted.

DR. HARLAND (Cotton Research Association) said the work which was being carried out at the Shirley Institute upon the various types of mould which caused cotton fabrics to deteriorate indicated that in those cottons in which the nitrogenous material was reduced to a minimum, there was very much less susceptibility to attack by mould.

MR. C. F. CROSS said that the large scale operations of Messrs. Lymm and Langwell had resulted in the elimination of many of the errors which were encountered in the earlier and smaller experiments. Mr. Langwell, if he wished, could throw a lot of light on the question of oxgyen equilibrium and acid basic equilibrium, and on the question of other modifying bodies present in relatively small quantities, but which sidetracked or influenced the change during fermentation and had to be watched very carefully. In any discussion of this nature it was most useful to keep to the practical industrial side. They wished to know whether alcohol could be made at £10 per ton or acetic acid at £15 a ton.

DR. HUTCHINSON, speaking of work carried out in 1917 in an endeavour to dispose of the surplus straw which promised at that time to reach stupendous proportions as the result of the food production campaign, said it was found necessary to have an adequate supply of air, and also a supply of nitrogen, preferably in an inorganic mineral form. Given these conditions, straw was rapidly broken down.

MR. H. E. THORNTON (head of the Bacteriological Department at Rothamsted) gave an account of experiments carried out to apply unrotted straw to the land and at the same time secure an increase in crop yield.

DR. W. R. ORMANDY supported the view expressed by Mr. Cross as to the discussion having tended to the theoretical rather than the practical side, and suggested that Mr. Lymm's paper should be read at a special meeting of the Section when it could be discussed in all its practical bearings. He again spoke of a coming shortage in petrol supplies to meet which alcohol would have to be produced. He did not agree that only so-called waste materials should be used for this purpose, and there were processes in Switzerland and Germany for the production of fermentable sugars from wood whereby it was possible to obtain 300 litres of 100 per cent. alcohol from one ton of dried wood substance. It was not a question of obtaining alcohol to compete with petrol at its present price, but at the price it might easily attain in the course of a year or two.

MR. LANGWELL referred to the large scale upon which the experiments described by Mr. Lymm had been carried out and to the ease with which the products obtained could be changed over within a few hours, from, say, acetic acid and methane at one end to lactic acid at the other. On the technical side, the process was very far advanced.

SIR FREDERIC NATHAN briefly replied on the discussion.

Manchester Section: Abstracts of Papers

THE Manchester Section held its eighth meeting of the session on Friday, May 4, Dr. E. Ardern, F.I.C., being in the chair.

Reflections on Patents

Mr. HOWARD CHEETHAM, in a paper on this subject, said that in the nature of things, quite apart from legislative action, scientific work tended to be less remunerative than its industrial application. As soon as a discovery was made known it ceased to belong to the discoverer, and became the property of any one able to appreciate its nature and bearing. The same thing was true precisely of an industrial invention so far as its inherent nature went. The only natural hindrance to the general dissemination of industrial inventions and their adoption forthwith by everyone interested, was the common reluctance to change, and that the inventors might conceivably be already in the industry to which it directly applied and so got a start, or for a time preserved some sort of secret. The patent law had modified the natural law, as regards industrial invention, but had not so far done much towards interfering with natural conditions as concerns scientific discovery.

So far as this country was concerned, it seems probable that the restriction of patent rights to "the sole working or making of any manner of new manufacture within this realm to the true and first inventor or inventors of such manufactures," was due to the intense realisation of the iniquity of the capricious grant of monopolies over articles of ordinary consumption rather than to deliberate decision that scientific discovery merited reward. It still sometimes happened that the scientific explanation was subsequent to industrial application, the ordinary steam injector being an instance. In England the ruling out of pure scientific work from protection by patents had been by judicial interpretation of the statute. In France the reverse was the case, scientific work as such being explicitly excluded both in the commendation of the statute before its passage, and also in the terms of the statute itself. This clear statutory statement seemingly has stimulated French opinion and led to very eloquent expression of

the needs and claims of scientific and inventive workers, and the formulation of a scheme of statutory revision of the French law by the Union of French inventors and the French Society of Chemical Industry and others (*La Propriété Industrielle*, 1922, p. 85), and also in the creation and organisation by decree of a National Office of Scientific and Industrial Research and of Inventions (*La Propriété Industrielle*, 1923, pp. 46–49).

Inorganic Constitution of Coal

In a paper (Part 4) on "The Melting Point of Coal Ash," by Messrs. F. S. Sinnatt, M.B.E., M.Sc., F.I.C., A. B. Owles, A.I.C., and N. Simpkin, M.Sc., A.I.C., the authors described a new method of determining the melting point of coal ash. The method had been used by them for the past four years, and the determination was performed in an apparatus which consisted essentially of a small compact furnace constructed from a magnesia brick bored through the centre to take a silica tube one inch in diameter. A vertical hole of similar size was bored at right angles so that the silica tube could be heated by means of an oxy-coal—gas burner placed beneath the brick. Determinations could be carried out upon 0·2 gms. of coal ash. This was a distinct advantage over the "cone" method, since the latter required a much larger quantity of ash. The ash itself is prepared in the form of a small thread, $\frac{1}{32}$ of an inch in diameter. Concordant results could be readily obtained in many determinations carried out on the same ash.

The method had been used in an investigation upon the melting point of the ash from the four banded constituents of coal—vitrain, clarain, durain and fusain—the small amount of ash required for the determination being a distinct advantage in the case of vitrain, the ash content of which might be as low as 0·9 per cent. It was shown that the ash from coal taken from different horizons in the same seam might differ very considerably in melting point, making careful sampling of a seam a very essential factor, since certain bands in a seam might possess a very high melting point (over 1,440° C.) in comparison with the bulk of the seam. Graded commercial coals from the same seam usually varied in the melting point of the ash from the various grades. It was difficult to correlate the melting point of a coal ash as determined in any melting point apparatus with the actual results found in practice.

In conclusion, the authors pointed out that owing to the complex nature of coal ashes, it was not possible to predict the melting point from a knowledge of the chemical analysis.

Behaviour of Celluloses towards Iodine and Dyestuffs

Mr. J. HUEBNER, M.Sc.Tech., F.I.C., in presenting a paper by himself and Mr. J. H. Sinha, M.Sc.Tech., B.Sc.(Cal.), said that they had investigated the behaviour towards iodine and dyestuffs of the principal celluloses used in the industries. They had found that the amount of hygroscopic moisture in different celluloses varied considerably. The ligno celluloses, *i.e.* jute and mechanical wood pulp, contained the highest, cotton the lowest amount of moisture. The length and diameter of the different fibres also showed great variation, and it was suggested that these variations might be partly responsible for the behaviour of the fibres towards iodine and dyestuffs. It was found that the bleached celluloses, with the exception of poplar, straw and esparto, absorbed about the same amount of iodine, whilst unbleached wood celluloses and ligno-celluloses absorbed very large amounts of iodine.

A comparison of the results of the absorption experiments, in which methylene blue and metanil yellow, respectively, were used, with the moisture content and the iodine absorption figures of the fibres, showed a distinct similarity. Very marked differences were noticed when the celluloses from the iodine absorption experiments were filter pressed. The colours of the different cakes varied from cream to dark brown. After immersion of the cakes in water, still more remarkable changes had taken place. Poplar cellulose had become white, bleached soda wood and esparto had become yellow, straw, linen and cotton light blue, whilst the unbleached celluloses and the ligno-celluloses had remained dark brown. In the case of poplar cellulose a distinct odour of iodoform was present, which was also noticed in the case of other celluloses after the end point of the titration had been reached. The authors then investigated the conditions under which iodoform was produced. It was found that poplar cellulose gave the highest yield, *i.e.*, 1·5 per cent. of iodoform being formed in one operation. Iodoform was still produced after repeating the operation twelve times.

Pure cotton fabrics yielded much smaller quantities of iodoform than poplar, and beta-cellulose yielded more than alpha-cellulose. Iodoform was also obtained from viscose silk, cuprammonia silk, degummed natural silk, scoured wool, sago starch, cane sugar, indiarubber, and French resin. A great number of experiments were carried out, such as distilling cellulose with caustic soda, boiling with soda under high pressure, etc., from which the authors concluded that the formation of iodoform from bleached cotton cannot be solely attributed to the presence of cutin or the dry protoplasm which represents a very minute portion of the fibres, but that the main source from which an appreciable yield of iodoform is obtained must be the cellulose itself.

Institution of Petroleum Technologists

Chemical Constitution of Egyptian Oil

THE seventy-first ordinary general meeting of the Institution of Petroleum Technologists was held on Tuesday last at the House of the Royal Society of Arts, John Street, London.

Mr. H. Barringer, presided over a fairly well attended meeting, and a paper by Mr. W. A. Guthrie, F.I.C., F.R.S.E., etc., on "Heavy Grade Egyptian Crude Petroleum" was read by Professor J. S. S. Brame, F.I.C., F.C.S., in Mr. Guthrie's absence in Egypt. The author pointed out that it was hoped at a later date to put before the members the results of the complete chemical examination of the Egyptian oils, for although some workers believed that the results obtained did not compensate for the enormous amount of time and study necessary, a different opinion was held by the writer and his colleagues. In their view the relation between the chemical composition of various oils (for instance, the two distinct types of Egyptian crude oil—one light paraffin base, and the other heavy mixed base) and their mode of occurrence must some day throw light on their origin. The heavy grade crude petroleum discussed in the paper is found at Hurghada (Rargada), situated some 200 miles south-east of Suez, on the western shore of the Gulf of Suez. "The oil," he said, "is found at a depth of from 1,600 to 2,000 ft. and is a mixture of paraffin base and asphaltic base petroleum; it has quite a pleasant smell, despite its sulphur content (2·2–2·5 per cent.), and when seen in a thin film is brownish-black in colour, while the calorific value is just under 19,000 B.T.U.'s per pound. The oil contains traces of vanadium and nickel. The ultimate analysis is: carbon, 85·15 per cent.; hydrogen, 11·71 per cent.; sulphur, 2·25 per cent.; oxygen and nitrogen (by difference), 0·89 per cent.

"The chemical examination of the oil is still very far from being complete, for, as all workers in this field know, the problem is an extremely difficult and complex one. It is further complicated by the fact that the only practical known method of separating the constituents of a crude oil is fractional distillation, which, at any rate when conducted at atmospheric pressure, alters the composition of the fractions to an extent not fully realised by many investigators. In order to obtain fractions which would have a closer relationship in chemical composition to the state in which they existed in the original crude oil, distillations had been conducted right down to coke, under a vacuum of 28 in., and using liberal supplies of steam. It is interesting to note that by this means the final temperature of the vapour has been reduced from 371° C. to 223° C. Not only so, but whereas in the earlier fractions from these vacuum distillations, very little, if any, bromine is absorbed at all; in the earlier fractions from an atmospheric distillation unsaturated hydrocarbons exist to the extent of from 3 to 10 per cent., as determined by the amount of bromine absorbed in 15 minutes in the dark. Moreover, in the later fractions from an atmospheric distillation as much as 40 per cent. of unsaturates have been found, while in the same fractions, from a vacuum distillation these have been reduced to from 10 to 20 per cent." It was extremely difficult to say with any degree of certainty what these com-

pounds were which absorbed bromine in the dark in 15 minutes, but the absorption could not be unconnected with the presence of olefines and di-olefines. In this respect, it was also interesting to observe that whereas the unsaturates present in the fractions from the atmospheric distillation were almost entirely removed by 80 per cent. sulphuric acid (pointing to di-olefines) the unsaturates in the fractions from the vacuum distillation are only partially removed by the same reagent. It had been ascertained also that in the first six fractions from a vacuum distillation, amounting to 30 per cent. in the original crude oil, there was an average of 16 per cent. of aromatic hydrocarbons. The final boiling point in vacuo was 153° C. The aromatics were determined by the Tizard-Marshall aniline point method and checked by the change in specific gravity, after sulphonation with 98 per cent. sulphuric acid. In the remainder of this 30 per cent. of the original crude paraffin hydrocarbons predominate, naphthalenes being present only in very small amount. Of the intermediate and higher boiling fractions, nothing very definite was yet known, excepting that both contain considerable quantities of unsaturated olephenic hydrocarbons and the latter much solid paraffin wax.

The commercial distillation products were then dealt with in detail, the oil yielding 6 to 8 per cent. benzine boiling below 150° C., and 14 to 15 per cent. kerosine, boiling between 150° and 290° C. The methods of dealing with the residue were then considered. The bitumen and pitch were found particularly valuable, while paraffin wax was not at first very readily obtained. Various experimental methods of cracking were also dealt with, one which was conducted under the moderate pressure of 30–35 lb. to the sq. in., and at a temperature of 360° C., was very satisfactory, 70 per cent. of "cracked oil" being obtained. The properties and distillation of one or two other Egyptian oils were also referred to at the conclusion of the paper.

Conference on Photographic Theory

THE Faraday Society will hold a general discussion on the physical chemistry of the photographic process subject on Monday, May 28, in the hall of the Institution of Electrical Engineers, Victoria Embankment, W.C.2. Professor W. D. Bancroft, of Cornell University, will open the proceedings at 3 p.m., with an introductory address on "The Theory of Photography." This will be followed by detailed consideration of the subject sub-divided as follows:—(1) "The Physical Chemistry of the Vehicle and of the Emulsion"; (2) "Reactions in the Plate during Exposure"; (3) "Development and Characteristics of the Developed Plate"; (4) "Adsorption Reactions in Photographic Films."

Each section will be introduced by a preliminary address and followed by general discussion. Among those who will read papers are Dr. T. Slater Price, Dr. F. C. Toy, Mr. Olaf Bloch, Mr. T. Thorne Baker, M. Clerc, Professor Luther, and Professor Goldberg. Several communications will be made from Mr. S. E. Sheppard and other members of the staff of the Eastman Kodak Company, and papers are also expected from Dr. Chr. Winther, Dr. Luppo Cramer and Professor L. Plotnikov. Between the afternoon and evening sessions a complimentary dinner will be given at the Hotel Cecil to Professor Bancroft and the other guests. Members of the Chemical Society are invited to attend this meeting. Full particulars may be obtained from the Secretary of the Faraday Society, 10, Essex Street, London, W.C.2.

Affairs of Sangley's Drug Stores

THE failure of Edward Cranston (trading as Sangley's Drug Stores), 314, Sangley Road, Catford, S.E., came before Mr. Justice Astbury, sitting in bankruptcy in the Chancery Division of the High Court on Monday. Mr. E. W. Hansell, on behalf of the trustee in the bankruptcy (Mr. Parkin Stanley Booth) asked for an order against Mr. H. Carey Grattan, the trustee under a deed of assignment executed by the debtor on November 28 last, to pay over all moneys, goods, and property that had come into his hands as trustee under the said deed on the ground that all the property comprised therein formed part of the property of the debtor divisible among his creditors. Mr. Justice Astbury granted the application and made the order as desired.

The Theory of Colloid Chemistry

Electric Charge on Emulsoids

ON Tuesday, a lecture was given at University College, London, on the "Electric Charge of Colloids," by Dr. B. R. Kruyt, of the University of Utrecht. Professor Donnan in introducing the lecturer pointed out that Dr. Kruyt was a pupil of the school of van't Hoff, where the foundations of our knowledge of the subject were laid.

Dr. Kruyt, who read his paper in excellent English, gave first a very comprehensive account of the development of the theory of electric charge on colloid particles, and its influence on their stability. With suspensoids the theory had received confirmation early, in the discovery that the coagulating power of electrolytes was dependent on the valency of the cation (for normal or negative colloids). The theory seemed well established for suspensoids, but emulsoids appeared to obey other laws, and there were also exceptions among the suspensoids, *e.g.*, stannic oxide. He explained that the electric charge which was essential to the stability of the colloid was due to an electric double layer at the surface of the particle which was probably formed of ions of hydroxyl, etc., attracted by incompletely satisfied atoms in the substance itself (*i.e.*, atoms at the surface of the particle not being entirely surrounded by oppositely charged atoms). This double layer might be discharged mechanically by precipitation, as in the case of stannic oxide where the coagulating agents which acted exceptionally were found to give insoluble stannates, thus removing the double layer and coagulating the colloid.

The case of emulsoids for long did not seem to be amenable to similar laws, but it was shown by the most recent work on solutions of agar and other gums that if very dilute (millimolar) solutions of electrolytes were used, then the coagulating power was found also to depend on the equivalent concentration and the valency of the cation. The extra sensitiveness was due to the fact that proteid substances were amino acids in many cases and therefore amphotelic electrolytes, and thus had a much less tendency to form an electric double-layer. Again, partial coagulation could be produced by adding dehydrating agents such as alcohol, in fairly high concentration, since these removed part of the double layer and rendered precipitation very easy. Thus emulsoids were amenable to the same laws as had been established for suspensoids.

Carriage of Zinc Ash

ON Wednesday, April 25, Mr. Justice Greer, in the King's Bench Division, heard an action in which Messrs. Arthur H. Brandt and Co., of London, and Mr. F. W. Vogel, trading as Messrs. Vogel & Cia., of Buenos Ayres, claimed damages from the River Plate Steam Navigation Co., Ltd., of Royal Liver Buildings, Liverpool, for breach of contract in relation to the carriage of goods by sea. There was a counter-claim for £167 3s. 7d., balance of charge for discharging, reconditioning and reloading part of the cargo at Buenos Ayres.

It was stated that a quantity of zinc ash was shipped on board the *Bernini* at Buenos Ayres, and that part of the cargo which was stored in No. 1 hold had got wet, and as it was generating heat it was turned out, on the advice of Lloyd's agent, and the ship sailed without it. Later the ash was dried and reconditioned, and shipped three months afterwards on board the *Cavourn*. During the interval the market for this commodity fell. It was submitted that there was unreasonable delay. All the evidence called was directed to elucidating whether zinc ash was or was not a dangerous commodity. Evidence was given for the defence by Mr. Alfred Henry Knight, F.J.C., of Liverpool.

His Lordship gave judgment for the plaintiffs, since the damage that had arisen was due to causes or the consequences of which the defendants were not by the contract excused, since the bags were wet when delivered to the ship. Having regard to the findings of fact that the shipowners' agents, by reason of their failure to exercise reasonable care, discharged more cargo out of the ship than was reasonably necessary and caused unreasonable delay in reconditioning and reshipping the bags, the apparent injustice to the shipowners was probably not serious.

Treasures for the Bookman and Scientist

A Great Enterprise in Publication

OWING to the proportions to which it has grown the Book Department of Benn Brothers, Ltd., has been formed, as recently announced, into a separate branch of the business to be known as Ernest Benn, Ltd. Sir Ernest Benn, chairman of Benn Brothers, Ltd., will be chairman also of the new company, and the managing director will be Mr. Victor Gollancz, who for the past two years has been manager of the Book Department of Benn Brothers, out of which the new business has developed.

In its new form the directors place in the fore-front of their programme the production of books on fine and applied art of the kind which they have produced over the old imprint Benn Brothers, Ltd. with remarkable success during the last two years. The key-note of these books will be in the future as in the past a combination of literary excellence and fine production; the work of authors of indisputable authority will be given distinguished typographical presentation and illustrated with the greatest beauty and accuracy to which modern reproduction processes can attain.

The series of monographs on "Ceramics" of which Mr. Hetherington's "Early Ceramic Wares of China," Mr. R. L. Hobson's "Wares of the Ming Dynasty" and Mr. King's "Chelsea Porcelain" were conspicuous successes will be continued and enlarged; a work on "Old Dutch Pottery and Tiles" is just ready, and this will be followed at a later date by a comprehensive volume from the pen of Mr. Bernard Rackham, Keeper of the Department of Ceramics at the Victoria and Albert Museum on "English Pottery" in which the author will present the subject from a fresh and strikingly original point of view.

Oriental art will maintain its prominent place in the general scheme. In this sphere Mr. A. F. Kendrick's "Hand-Woven Carpets," which immediately took its place as a standard English work on the subject upon its publication last Christmas, and Mr. Cescinsky's "Chinese Furniture," will be followed next autumn by monographs on "Chinese Painting" by Mr. Arthur Waley, "Chinese Jades" by Dame Una Pope-Hennessy, "Japanese Colour Prints" by Mr. Laurence Binyon and Major J. J. O'Brien Sexton and (a little later) "Chinese Sculpture" by Mr. Leigh Ashton of the Victoria and Albert Museum. All of these works will be copiously illustrated in colour and monochrome.

Modern art, English and European, will have its due share of attention. It is hoped to publish in a week or so a translation of Julius Meier-Graefe's "Degas," illustrated by over 100 collotype plates and a few days later will come the first six volumes of the Contemporary British Artists Series—dealing with the work of Augustus John, George Clausen, William Nicholson, Paul Nash, Professor William Rothenstein and Sir William Orpen. This series is an attempt to provide for those interested in British artists the kind of book which has for many years been available to students and admirers of continental art. Each volume will contain about 35 plates reproduced in half-tone.

As is fitting in the case of a firm which will lay special stress on excellence in typography, books on this subject will not be lacking. The first will be a work to be published probably in the autumn from the pen of Mr. Stanley Morrison entitled "Four Centuries of Fine Printing." The book will trace the development of typographical style and decoration from Jessen to Bruce Rogers and will be illustrated by 500 facsimiles of masterpieces of printing reproduced in collotype—a number of these plates being in colour and nearly all of the size of the original. In this connection mention may be made of "The Player's Shakespeare"—the first two volumes of which have just been published. This, the first of the firm's series of fine books to bear the imprint of Ernest Benn instead of Benn Brothers, has been hailed by the critic of *The Morning Post* as "A credit to our generation and an honour to its august subject."

But it will by no means be art books alone which will occupy the attention of the directors. In the sphere of science and technology Ernest Benn, Ltd. will continue and extend the tradition of Benn Brothers, Ltd., with its 40 years' experience of this field, and the new company hopes to develop the activities of the old so as to make available for the service of British industry authoritative text books covering every field of commercial activity along the lines adopted in the planning of their Gas and Fuel Series now in course of production, the first volumes of which, and notably Mr. Alwyne Meade's "Modern Gasworks Practice" and Dr. Geoffrey Weyman's "Modern Gasworks Chemistry" have been in such wide and continuing demand.

The firm hopes also to be in a position to forecast shortly the publication in the autumn of the first volumes of a series of historical works, and it may indeed be said that all such books as have a serious and specialised interest will find a place in their programme. This development of the old Book Department of Benn Brothers into a special organisation will involve no change in general direction or financial control, and the address is the same as that of the parent company—8, Bouverie Street, E.C.4.

Light on the New Element

WRITING in *Nature* of May 5, Dr. Alexander Scott, who was reported to have discovered the element hafnium in the refractory substance obtained from a black titaniferous iron sand from New Zealand and believed to be the oxide of the newly discovered element hafnium, brings the matter up to date and clears up certain points. Three specimens were sent to Copenhagen by Dr. Scott: (*a*) the sand itself, (*b*) the cream-coloured substance labelled in 1918 "New Oxide," (*c*) the cinnamon-coloured oxide which resulted from the atomic weight determinations. After a thorough and laborious examination, both by X-ray and by optical spectral analysis, conducted by Messrs. Coster and Hevesy, their final report was that the chief components were undoubtedly iron and titanium with traces of manganese, aluminium and magnesium. Dr. Scott then set to work on what remained of (*b*) and (*c*) to try to unravel the mystery of the high atomic weight which had seemed to prove conclusively that the oxide was that of an element with an atomic weight at least one and a half to two times that of zirconium (90·6). The further chemical examination of the cinnamon-coloured powder (*c*) agreed entirely with that of Drs. Coster and Hevesy in proving that it consists practically of oxides of titanium and iron, the latter only to the extent of about half a per cent.

The "New Oxide" (*b*), however, seemed to be a new *oxide* but not the oxide of a new *element*. Further investigation showed it to contain a large percentage of silicon and that, so far as could be ascertained with the small quantity available, there seemed to be but little doubt that it was a form of titanium dioxide in which part of the titanium was replaced by silicon. It was due in all probability to this replacement of titanium by silicon that the "New Oxide" owed its resistance to the attack of sodium bisulphate on one hand and caustic soda on the other.

The substance extracted from a New Zealand sand by Dr. C. J. Smithells and Mr. F. S. Goucher in the Research Laboratories of the General Electric Company, says Dr. Scott, is entirely different from his new oxide, which is clearly proved by their own statements.

Cancer from Paraffin and Tar

THE Medical Correspondent of *The Times* states that researches on the relationship between various paraffin oils and tars and the occurrence of cancer are being actively pursued in many countries. One of the most interesting of these is the occurrence of cancer in the lower part of the body in "mule spinners" in the cotton industry. These men, at frequent intervals, come into contact with an oily bar of steel, which causes their linen trousers to become saturated with heavy paraffin at a particular spot where cancer is very apt to develop. Large numbers of cancerous tumours have recently been induced to grow in mice by anointing them with tar. Attempts to effect changes by means of vitamin feeding were unsuccessful. A distinguished British authority has stated that he believes there is present in crude paraffin an actual causal agent of cancer—in contradistinction to a predisposing irritant. Many years, however, and prolonged exposure seem to be necessary in the case of human beings before ill-effects are observed.

An Improvement for Mercury Pressure Gauges

AMONG the papers given before the Physical Society of London at a meting on April 27 was one on "A Simple Regenerative Vacuum Device," by Dr. H. P. WARAN, M.A., Ph.D.

The paper dealt with the difficulties arising from residual traces of air fouling the vacuum above the mercury column in syphon gauges and other devices. A remedy was suggested in the form of a small attachment taking the shape of bent capillary tube ending in a bulb. This enabled the air to be repeatedly pushed into the vacuum of this bulb, the mercurp at the bottom of the capillary preventing the subsequent return of the air. With such an arrangement fitted to the top of a syphon gauge the height of the column of mercury became a true measure of the gas pressure, subject only to the definite correction for the vapour pressure of mercury and temperature. The device was regenerative in the sense that, irrespective of any progressive fouling of the vacuum, a fresh air-free vacuum was automatically created by it every time it was brought into action. As typical examples of the wide field of utility of the device its application to mercury barometers and to mercury vapour lamps was also briefly discussed. In replying to the discussion, the author said that the device could very readily be combined with an oil-trap and drying tube. Various difficulties had to be overcome in practice, but there was none in getting the mercury to move the bubbles provided a capillary tube of 0·5 mm. diameter be used. It was not surprising that the idea should have occurred to others, but he was not previously aware of the fact and had thought that other workers might find the device useful. It would not be effective for an indefinite period, but might increase the life of a barometer by some years.

A Practical Demonstration of Smoke Prevention

A DEMONSTRATION of smoke abatement was held on Thursday, May 3, under the direction of Mr. W. H. Casmey, a Bradford engineer, and the Wakefield Health Committee, at Paton and Baldwin's works at Wakefield, before a number of public men and manufacturers. It was shown that with careful stoking no smoke at all was produced from a given fire, while if the rules laid down were not observed large volumes were produced. Mr. Casmey said that the dirtiest chimney could be cured by making a ratio of 2 to 1 between the grate area and the area of outlet from the furnace flues. That was all that was necessary for the prevention of smoke. The worst chimney in the world could be cured by the adoption of that ratio, and it could be done for less than a five-pound note. At the same time the consumption of coal was reduced by nearly 10 per cent., because the combustion was rendered chemically complete.

The Calorific Value of Coal

AT the general meeting of the North of England Gas Managers' Association on Friday, May 4, among the papers read was one by Dr. W. B. Davidson, on the "Calorific Value of Coal," Mr. J. E. Blundell (Carlisle) being in the chair. After a general resumé of the importance of a knowledge of the calorific value of fuels, Dr. Davidson described in particular the calorimeter he used to determine the calorific value of coal. He submitted that a knowledge of this value was the best criterion for purchasing coal for gas production, as suggested that it might be well if coal as well as gas were sold on a thermal basis. He also described a new form of calorimeter, used in determining the calorific value of coal gas.

Dyestuffs Import Regulations

THE following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during April, has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee. The total number of applications received during the month was 512, of which 430 were from merchants and dealers. To these should be added the 22 cases outstanding on April 1, making a total for the month of 534. These were dealt with as follows:—Granted—331 (of which 318 were dealt with within seven days of receipt). Referred to British makers of similar products—130 (of which 121 were dealt with within seven days of receipt). Referred to Reparation Supplies available—56 (all dealt with within two days of receipt). Outstanding on April 30, 17. Of the total number, 534, of applications received, 479, or 90 per cent., were dealt with within four days of receipt.

Chemical Matters in Parliament

Industrial Poisoning

Mr. Hancock (House of Commons, May 2) asked the Minister of Health the number of cases of industrial poisoning for each of the last three years, and the number of fatalities.

Mr. Bridgeman, replying on behalf of the Minister, said that if the hon. Member was referring to the industrial diseases notifiable under the Factory and Workshop Act, the numbers were as follows: In 1920 there were 514, of which 38 were fatal; in 1921 there were 350, of which 32 were fatal; and in 1922 there were 410, of which 35 were fatal.

Workmen's Compensation

Mr. W. Thorne (House of Commons, May 7) asked the Secretary of State for the Home Department whether any provision would be made in the amending Workmen's Compensation Bill to bring in the men who suffer from silicosis in the wet-grinding industry.

Mr. Bridgeman replied that no such provision would be needed, as special powers were given by the Workmen's Compensation (Silicosis) Act, 1918, to make a scheme of compensation for any industry involving exposure to silica dust. A comprehensive inquiry by the Factory Department into the conditions of the different sections of the grinding industries had recently been completed, and as soon as the Report of this inquiry was presented, he proposed to ask the Departmental Committee now sitting to consider and report on a scheme for the grinding industries.

British Dyestuffs, Limited

Lieut.-Commander Kenworthy (House of Commons, May 8) asked the President of the Board of Trade who were the present directors of the British Dyestuffs, Ltd.; what were the total sums paid per year in directors' fees; whether any of these gentlemen reside in the neighbourhood of the works, either at Huddersfield or Manchester; and how many of them had previous experience of the dye-making trade.

Viscount Wolmer said, in reply, that the only directors appointed by His Majesty's Government were Lord Ashfield and Sir Henry Birchenough. Their remuneration was £1,000 per annum. The other directors, appointed by the shareholders, were Sir William Alexander, Mr. G. V. Clay, Sir William Robertson, and Mr. G. P. Norton. He was not in a position to answer the last part of the question.

Mr. Grattan Doyle asked if Lord Wolmer would satisfy the ambition of the hon. and gallant member for Central Hull (Lieut.-Commander Kenworthy) by appointing him to the board of this company.

Lieut.-Commander Kenworthy then said he wanted to put a serious supplementary question: had the Government guaranteed this money, and had they no share in the appointment of the other directors? To this Viscount Wolmer replied that the Government had the right to appoint two directors, the other directors being appointed by the shareholders.

Ferric Hydrate Pigments

A RECENT United States patent describes the preparation of a series of pigments ranging in colour from lemon-yellow to bright brown by the oxidation of freshly precipitated ferrous hydroxide under varying conditions. For example, a lemon-yellow pigment is stated to be produced by treating a solution of ferrous chloride with sufficient calcium hydroxide to throw down about 80 per cent. of the iron, and oxidising the mixture by a current of air and steam until the lemon tint is developed. Similarly, by precipitating ferrous chloride with sodium carbonate and oxidising with air and steam at a higher temperature a bright brown is produced.

The Composition of Scheele's Green

ACCORDING to G. Bornemann, Scheele's green, which differs from emerald green in not containing any acetate of copper, is a neutral hydrous copper arsenate of the formula $3CuAs_2O_3{\cdot}HO$, and not the acid ortho-arsenate of copper, $CuHAsO_3$. The composition, however, varies considerably with the method of preparation—the greater the excess of alkali employed, the higher is the content of copper in the finished product.

From Week to Week

IN CONNECTION with the centenary of Pasteur to be celebrated at the Universities of Paris and Strasbourg this month, Sir William Pope and Professor Nuttall have been appointed representatives of Cambridge University.

A BOY, aged 6½, when amusing himself on the glass roof of a chemical works in Cavendish Street, Glasgow, recently fell through the glass to the floor beneath, a distance of 15 feet, suffering injuries to his head, hands and legs.

A TABLET COMMEMORATING the gifts of Sir Ralph Forster towards the new chemistry building at University College, London, was unveiled on Friday by the Rt. Hon. Viscount Chelmsford, chairman of the College committee.

THE MINISTER OF LABOUR has appointed Mr. W. B. Yates to the vacancy created by the death of Sir Thomas Munro in the chairmanship of the committee which is considering the trade dispute qualification for unemployment benefit under the Unemployment Insurance Acts.

COMPAGNIE COMMERCIALE DU NORD, 54, Gracechurch Street, London, E.C.3, announce that they have been appointed sole selling agents for London and district, as well as the South of England, of W. and F. Walker, Ltd., Colonial House, Liverpool, for their white spirit and paint oils.

THE OFFICES of the Chemical Engineering Group of the Society of Chemical Industry have been removed from 24, Buckingham Street, Strand, London, to Abbey House (Room 308), Victoria Street, Westminster, S.W.1, to which address all communications should be addressed.

THE BIRMINGHAM AND MIDLAND SECTION of the Society of Chemical Industry will visit the B.S.A. works at Amory Road, Small Heath, on Wednesday next, May 16, through the courtesy of the B.S.A. Co., and on Thursday, May 24, a visit will be paid to the Bournville works of Cadbury Brothers.

MR. WILLIAM CULLEN, M.I.M.M., has joined the board of Messrs. Allen, Craig and Co. (London), Ltd., and is now chairman of the company. Mr. Cullen is also a director of the B.S.A. Explosives Co., Ltd., and is president of an important city club, and a prominent official of the Chemical Industry Club.

IN CONNECTION with the strike at the National Oil Works, Skewan, Neath, the leaders of the General Workers' Union and Electrical Workers' Union on Saturday instructed their members to cease work on Monday. Had they done so work would have been brought to a standstill. These men, however, refused to carry out the instructions and resumed work.

IN THE OFFICIAL REPORT by Col. Pringle to the Ministry of Transport on an accident to a London to Liverpool express last December, due to the fracture of an axle, it is stated that an analysis of the steel was made by the National Physical Laboratory, which found that there was an excess of sulphur and phosphorus, and considered that the metal had been rendered brittle by overheating.

SIR OLIVER LODGE opened the laboratory extensions of the Applied Science Department of the Sheffield University on Thursday, May 3, which were made possible by the munificence of the late Mr. Joseph Jonas and the late Mr. Edgar Allen, two of the leading steel manufacturers. He said he hoped that by the time that atomic energy was discovered the human race would be sufficiently civilised to use it only for good purposes. We were on the eve of its discovery, getting hopefully or dangerously near it, according as we regarded it.

THE HEARING was concluded in the King's Bench Division, on April 30, before Mr. Justice Coleridge and a special jury, of an action brought by the London Joint City and Midland Bank against Mr. Llewellyn Wynn McLeod and Mr. Cecil Gardner (executors of the late Earl of Shrewsbury and Talbot), Sir Henry Busby Bird and Mr. James Gibson, claiming £25,000 alleged to be due under a guarantee securing an overdraft on the account of the Aniline Dye and Chemical Co., Ltd. The jury failed to agree on any of the questions put to them by the judge, and were accordingly discharged.

THE GENERAL MONTHLY MEETING of the members of the Royal Institution was held on Monday, the Duke of Northumberland (President) being in the chair. Sir J. J. Thomson was elected Honorary Professor of Natural Philosophy, and Sir Ernest Rutherford Professor of Natural Philosophy. It was announced that the Duke of Northumberland (President) had nominated the following as Vice-Presidents for the ensuing year: Dr. Mitchell Bruce, Lord Iveagh, Sir Edward Pollock, Lord Rothschild, Sir Alfred Yarrow, the Right Hon. Lord Justice Younger, Sir James Crichton-Browne (Treasurer), and Sir Arthur Keith (Secretary). Dr. P. J. Le Riche and Dr. Liebert were elected members.

THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, of Pittsburgh, Pa., U.S.A., announce that they have just entered into a contract with the Virginian Railways Company for a complete electrification of the line between Mullens and Roanoke (in the State of Virginia) comprising 134 route miles and 215 miles of track. This line will handle a very heavy coal traffic with 6,000-ton trains up about a 2 per cent. grade, and 9,000-ton trains over the rest of the line. The contract includes the supply of 600-ton spilt-phase 25, cycle 11,000 volt locomotives of the most powerful type. The total contract, including a 50,000 kW power-house, amounts to $15,000,000, and is the largest electrification in the world up to date.

AT A MEETING of the Committee of the Bristol and S.W. Counties Section of the Institute of Chemistry, on Thursday, May 3, Mr. R. D. Littlefield, F.I.C., of Exeter, was elected chairman for the current year. The following tentative programme was drawn up for next winter, the meetings to be held, where practicable, on the middle Wednesday of each month from October to March. A visit from the President of the Institute or other prominent officer; a meeting at Exeter (on a Saturday); a joint meeting with the Bristol section of the Society of Chemical Industry; suggested joint dinner with the same society; a Bristol meeting, with a paper by a local member; and, in conclusion, the annual general meeting in March.

A MEETING of the Society of Glass Technologists will be held at University College, London, on Wednesday next May 16, followed by the fifth annual dinner at the Hotel Cecil, Strand, at 7 o'clock. The meeting will open at noon and the following papers will be given: "The Refractive Index Changes in Optical Glass occasioned by Chilling and Tempering," by F. Twyman, F.Inst.P., and F. Simeon, B.Sc., F.Inst.P. "Notes on Burettes," by Verney Stott, B.A., F.Inst.P. "A New Method of Glass Melting," by A. Ferguson. "The Drying Out and Warming Up of Tank Furnaces," by C. Saxton, A.M.I.E.E. "Notes on the Design of Pot Arches," by Th. Teisen, B.Sc., C.E. By the courtesy of the directors, a visit has been arranged on the morning of Thursday, May 17, to the new works of James Powell and Sons (Whitefriars), Ltd., Wealdstone, Harrow.

A SPECIAL COMMITTEE of the Building Research Board has been set up under the Department of Scientific Industrial Research to report on the best methods by which decay in building stones, especially in ancient structures, may be prevented or arrested. In the cases of historic buildings and ancient monuments, prevention of the decay and gradual demolition of tooled surfaces and main structures constitutes a special problem which has engaged the attention of many investigators for a considerable time without however, finding any generally satisfactory solution. The investigation involved is very complex and needs to be approached from different angles with the help of wide scientific knowledge. The chairman of the Committee will be Sir Aston Webb, and the other members will be Mr. R. J. Allison, Professor C. H. Desch, Mr. A. W. Heasman, Mr. J. A. Howe, Sir Herbert Jackson, Dr. Alexander Scott and Mr. H. O. Weller.

Lautaro Nitrate Co.

AN extraordinary general meeting of the Lautaro Nitrate Co., Ltd., was held on Wednesday, May 9, at River Plate House, Finsbury Circus, London, E.C., for the purpose of considering certain re olutions connected with a proposed increase of capital. The chairman said that the ultimate object at which they were aiming was to absorb the whole of the Lastenia Nitrate Co., and thus form a very large nitrate producing concern with Lautaro and Lastenia properties; in effect, the fusion of both companies. After some discussion the resolution was put and carried unanimously.

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Patent Literature

Abstracts of Complete Specifications

195,655. FERTILISERS. Plauson's (Parent Co.), Ltd., 17, Waterloo Place, London, S.W.1. From H. Plauson, 14, Huxter, Hamburg, Germany. Application date, June 28, 1922.

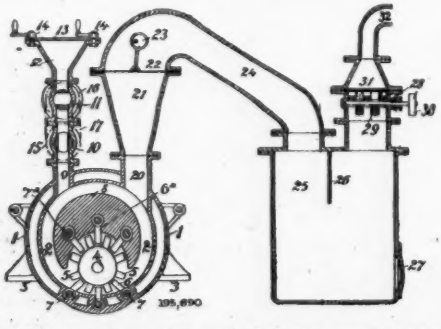
Phosphates, feldspar and other raw materials are ground and mixed with a large quantity of water and then subjected to mechanical disintegration in a colloid mill. It is found that if a small quantity of a water-soluble silicate such as water-glass is added, the time of treatment required is reduced from about one hour to three minutes. The dispersion is further facilitated if a very small quantity of free alkali or alkaline substance such as a carbonate or sulphide is added. A colloidal solution is obtained, and may be further treated in an ultra filter-press as described in Specification No. 181,023 (see THE CHEMICAL AGE, Vol. VII., p. 178). The phosphate, when dried, is a very fine powder, which is readily assimilated by plants. The colloid obtained as above is not reversible, but becomes so if an organic colloid is used in addition to the water glass in a slightly alkaline solution. Suitable colloids are sulphite cellulose liquor, natural or artificial tanning agents, proteins and water-soluble gums.

195,688. VANADIUM-CONTAINING MATERIALS, PROCESS OF REDUCING. H. Wade, London. From Vanadium Corporation of America, Bridgeville, Pa., U.S.A. Application date, November 30, 1921.

In this process, vanadium-containing materials are reduced to the metal by the use of carbon in an electric furnace, without a metallic reducing agent. It is found that the voltage employed must be at least 150 volts, with a current density of at least 35 ampères per square inch of cross section of the electrodes. The distance between the electrodes must be between 1 and 1·5 times the thickness of the electrodes. The charge is fed downwards between the electrodes so that it is carried directly into the reaction zone, and the reduced metal and slag are carried away from that zone by convection. The depending electrodes terminate above the level of the metal, so that the heating is effected by means of the arc through the charge. Vanadium is usually required in the form of ferro-vanadium, and in this case the vanadium-oxide or sulphide is mixed with iron scale or iron ore and a suitable flux. The vanadium reduction requires a very high temperature, a quick reaction, and a quick removal from the reaction zone. The reduction is effected in a furnace having a lining of amorphous and/or graphitic carbon.

195,690. DRY-GRINDING SOLID MATERIALS TO PARTICLES OF A DIAMETER OF LESS THAN 0·008 mm. Plauson's (Parent Co.), Ltd., 17, Waterloo Place, London, S.W.1. From H. Plauson, 26, Jarrestrasse, Hamburg, Germany. Application date, December 5th, 1921.

Materials are dry ground in a colloid mill *in vacuo* in the presence of small quantities of a dispersator, to produce very



fine colloidal materials. To maintain the vacuum it is necessary to use an ultra filter which is impermeable to particles of a diameter of 0·001 to 0·008 mm. The best results are obtained by using a grinding mill having a peripheral speed of 1,000–2,000 metres per minute, or a disintegrator of the beater type, having a peripheral speed up to 12,000 metres per minute. A suitable mill consists of an outer casing 1 and inner casing 2, between which a heating or cooling fluid may be passed. A rotating shaft 4 carries beater bars 5, which co-operate with fixed beater bars 6, 6a, secured to the casing and to a central member 8 respectively. The material is fed from a hopper 12 through valves 10, 11, which are interconnected so as to form an air lock while admitting the material. The material is discharged through a pipe 20 leading to a settling pipe 21, sieve 22, and pipe 24. The coarser particles return to the mill, and the finer particles pass into a chamber 25. The vacuum pump is separated from the vessel 25 by an ultra filter 31, which is not permeable by the fine particles. This filter is continuously cleaned by rotating brushes 29. The ultra filter may comprise a metal structure of superposed slotted plates in which the slots of adjacent plates are at an angle to one another. Alternatively, metal sieves formed from very finely spun wire may be used. These filters become choked with the fine material which ultimately forms the filtering medium, or the pores may be constricted by porous colloidal material such as cellulose esters, rubber, or cement. The dispersator employed may be 1 to 5 per cent. of water, or a 3 per cent. solution of water glass or sulphite cellulose liquor, or a tanning agent. If a dispersator is used, the materials will form colloidal sols with water.

195,710. CONCENTRATING LIQUIDS, PROCESS AND APPARATUS FOR. E. Zahm, 18, Manchester Place, Buffalo, New York, U.S.A. Application date, December 28, 1921.

The liquid to be concentrated is supplied to the upper end of a vertical cylinder which is jacketed and heated externally. The cylinder contains a concentric rotary drum, which is perforated at different points in its length and carries radial vanes, the outer edges of which nearly touch the inner walls of the cylinder. The upper end of the inner drum communicates with a vapour outlet which carries off the vapour which passes inwards through the perforations into the drum. The vapour passes to a vacuum condenser and the liquid to a cooler. The apparatus is particularly suitable for concentrating liquids which have a tendency to foam when they are concentrated by boiling at atmospheric pressure or *in vacuo*. The liquid in its passage through the apparatus is only exposed to heat for a few seconds.

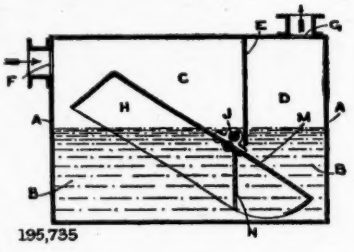
195,711. DESTRUCTIVE DISTILLATION OF COAL AND SIMILAR CARBONACEOUS SUBSTANCES. T. M. Davidson, Park Cottage, Sharps Lane, Middlesex; R. H. S. Abbott, Alexandra Mansions, Kings Road, Chelsea, London, S.W. Application date, December 29, 1921.

The object is to distil coal at low, medium, and high temperatures, to produce a coke which is non-fragile, and to recover the low-temperature oils. A horizontal retort is divided into three zones, (1) a low temperature zone, (2) a medium or higher temperature zone, and (3) a cooling zone in which the air supply for the combustion of gas for heating the second zone is preheated. The first zone in the retort contains a concentric vapour outlet pipe surrounded by a helical conveyor which feeds the coal through the retort. This outlet tube and conveyor terminate in the first zone, so that the charge is a subjected to compression only when in a plastic condition. The vapour outlet tube is provided with a longitudinal slot at the bottom, into which the vapour passes. A worm conveyor is also provided within this tube to remove any carbon deposits.

195,735. GAS WASHERS AND THE LIKE. F. G. Brockway, 24, Waverley Road, Elland, Yorks. Application date, January 4, 1922.

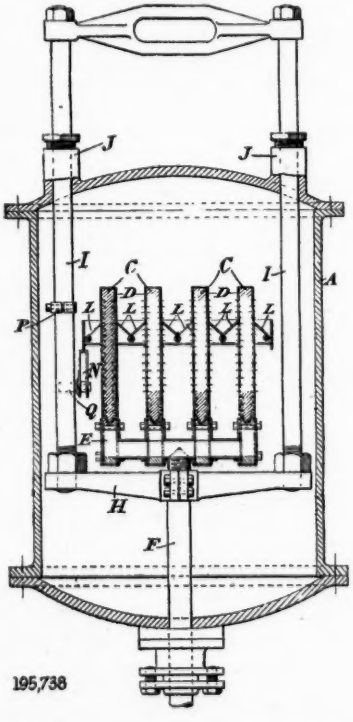
A rectangular tank A is divided into compartments C, D, by a partition E extending downwards into the washing liquid B. An inverted vessel H is suspended from a transverse shaft J which is mechanically oscillated. The gas to be treated is fed through the inlet F and a quantity is periodically trapped by the oscillating vessel H, carried below the liquid, and allowed to pass through a perforated baffle N and a perforated wall M into the compartment D. The gas is thereby atomised in its passage through the washing

liquid. This apparatus gives a longer contact between the gas and the washing liquid. A series of such washers may be employed, containing different liquids for the removal of different constituents from the gas.



195,738. Filtering Apparatus. Thermal Industrial and Chemical (T.I.C.) Research Co., Ltd., and J. S. Morgan, 52, Grosvenor Gardens, London, S.W.1. Application date, January 4, 1922.

In a filter of the type in which a flat filtering element is alternately immersed in the liquid and lifted out, the element is lifted into an atmosphere of steam or hot air under pressure. A series of filter plates C are provided with filtering cloths D stretched over their corrugated surfaces. The interior of each element communicates with a hollow header E, which communicates with a suction apparatus through a pipe F, and also supports the filtering element. The whole device is secured to a cross bar H having vertical guide bars I passing through glands J in the cover of the apparatus. The filter plates are first lowered into the liquid, and suction is applied until a filter cake of the desired thickness has accumulated.



The plates are then raised into the hot air or steam in the upper part of the vessel A, and suction is applied again so that the filtrate is carried out of the filter cake and the latter dried by means of the steam or air. The pipe F is then connected to a supply of air or steam at a higher pressure than that in the vessel A, so that the filter cake is loosened and the cloths cleaned. On the downward movement of the plates, the filter cake is removed by pivoted scrapers L which, when the plates pass completely below them, lie horizontally forming a tray. This tray is adapted to be tilted by a lever N actuated by a tappet P on the rod I, which strikes a projecting pin Q. The filter cake is thus discharged from the tray into a hopper within the vessel A.

195,753. Vat Dyestuffs Derived from Anthraquinone, Manufacture of. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, January 6, 1922.

A derivative of β-naphthoquinone which contains a mobile substituent such as a halogen or a sulphonic group, is caused to react with an α-amino-anthraquinone or an α-α-diamino anthraquinone. The products obtained are dark brown powders which give with hydrosulphite and caustic soda vats which have little affinity for vegetable fibre. The products may be condensed with an orthodiamino anthraquinone yielding vat dyestuffs which contain complexes of anthraquinone-α : β-naphthazine united by an NH-residue >N-H to an anthraquinone nucleus. One of the valencies of the nitrogen atom of the NH-residue>N-H being fixed in any position to the naphthylene nucleus of the anthraquinone-α : β-naphthazine and the other valency to one of the alpha-positions of the second anthraquinone nucleus. These dyestuffs are insoluble in water, but form a green solution in sulphuric acid. Brownish red vats are obtained with caustic soda and hydrosulphite, which give fast red to violet shades on cotton.

195,778. Distillation of Coal and other Bituminous Fuels, Apparatus for. G. Cantieny, 62, Rennweg, Nürnberg, Germany. Application date, January 11, 1922.

In distilling coal and other bituminous fuel in horizontal iron rotating retorts of large size, difficulties are experienced owing to the weakening of the iron plates due to the high temperature. In the present invention, this is avoided by mounting within the outer drum a supporting inner frame which may be a lattice girder or a concentric tube. In one construction, a concentric tube is mounted in the end walls of the retort, and the outer drum is supported from it by means of tension members. The fuel is fed to one end of the inner tube, and in passing through it, is preheated and the tube cooled. The fuel then passes into the outer drum through which it passes in the opposite direction. The gases are drawn off through a tube projecting into the inner tube to a point at which the temperature is sufficiently high to prevent condensation of the hydrocarbons.

195,798. Hydrogen or Gases Rich in Hydrogen, Manufacture of. J. H. West, 33, Inverness Terrace, Bayswater, London, A. Jaques, 37, Sandringham Road, Waterloo, near Liverpool, and C. B. Tully, Millgate, Newark-on-Trent. Application dates, January 19 and May 3, 1922.

The object is to obtain the maximum proportion of hydrogen by the complete gasification of fuel such as bituminous coal, which contains a relatively high proportion of volatile constituents. The coal is heated in a vertical, slightly diverging retort, which is surrounded by heating flues through which is passed the producer gas obtained by blowing air through the carbonised coal in a chamber below the retort. When the coal in the latter chamber is rendered highly incandescent by blowing air through it, steam is substituted for the air, and the resulting water gas passes into the bottom of the heating flues surrounding the retort. The distillation gas from the retort also passes into the bottom of the heating flues, and a mixture consisting largely of hydrogen and carbon monoxide, with some carbon dioxide, is obtained. Any volatile hydrocarbons which are not cracked in the retort, are cracked in passing through the heating flues. The temperature of the fuel in the chamber below the retort is sufficiently high to prevent the reaction by which carbon dioxide and hydrogen are obtained, so that the products are carbon monoxide and hydrogen. The mixed gases are then passed into a carbon monoxide converter where they are subjected to the action of additional steam at a comparatively low temperature, to produce carbon dioxide and hydrogen. The mixed gases are passed into the top of the converter at a temperature of 600°– 00° C., and the temperature gradually decreases to 400°–550° C. at the bottom. The converter may contain a catalyst, and the desired temperature may be maintained by means of hot blow gas from the generator. The carbon dioxide is then removed from the mixture, and the hydrogen may be finally separated by a liquefaction process.

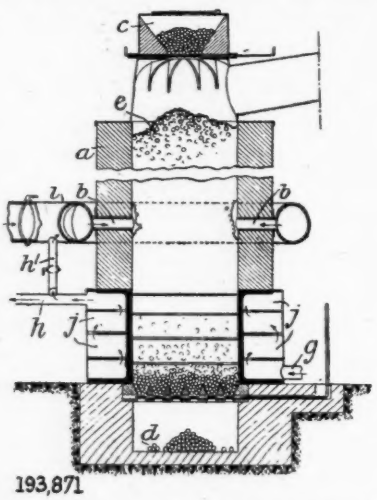
195,876. RESOLVING WATER-IN-OIL EMULSIONS, PROCESS FOR. H. A. Gill, London. From The Sharples Specialty Co., 23rd and Westmoreland Streets, Philadelphia, Pa., U.S.A. Application date, April 25, 1922.

The process is for reducing or destroying water in oil emulsions such as those in crude petroleum. When petroleum oil is refined with sulphuric acid and caustic soda then added to neutralise the acidity of the oil it is found that the salt produced is sufficiently soluble in the oil to produce an undesirable ash. If the acid is previously washed out a water-in-oil emulsion is obtained which cannot be separated by gravity or centrifuging. It is now found that the stability of this emulsion can be reduced or destroyed by adding a hydrophile colloid which is organic and contains no metal. The desired effect can be obtained by stirring into the emulsion about 0·1 per cent. of glue or gelatine and the emulsion may then be separated by gravity or centrifuging. Other colloids such as albumen, casein, gum arabic or gum tragacanth are also suitable.

International Specifications not yet Accepted

193,871. ALKALINE EARTH SULPHIDES. A. E. P. Bourdet, 6, Place Vintimille, Paris. International Convention date, February 27, 1922.

The apparatus is suitable for reducing chemical substances, such as alkaline earth sulphates to sulphides. Calcined gypsum is mixed with carbon or pitch, moulded into hollow bodies, and fed from a hopper *c* to a shaft furnace *a*. Gas from a producer is mixed with heated air, and introduced



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through tuyeres *b*. The air is preheated by drawing through baffle chambers *j*, where it cools the charge in the furnace. The hot air then passes through a pipe *h'* to mix with the gas. The reduced material is discharged through the grate to a chamber *d*.

194,260. CONCENTRATING ORES. Eureka Metallurgical Co., 68, South Main Street, Salt Lake City, Utah, U.S.A. Assignees of C. M. Nokes, 1704, South 5th East Street, Salt Lake City, Utah, U.S.A. International Convention date, March 4, 1922.

The process is for concentrating oxidised or non-sulphide ores by flotation. Sodium sulphide is pulverised and made into a paste with melted paraffin, and stirred while solidifying. This mixture is then ground in a tube mill to a pulp, together with the ore. The ore is then concentrated by froth flotation, using an oil such as pine oil as a frothing agent. Alternatively the sodium sulphide and paraffin are ground together, heated to a temperature below the fusing point of sodium sulphide, and sprayed into the ore pulp.

194,289. HYDROGEN, NITROGEN, SULPHUR DIOXIDE, FERTILISERS, ETC. C. Harnist, 43bis, Rue Billancourt, Boulogne, France. International Convention date, March 1, 1922.

Sulphur or sulphides are treated alternately or simultaneously with steam and oxygen or air to obtain sulphur dioxide and hydrogen, with or without nitrogen. The gases may be freed from oxygen by passing them through waste cellulose lye containing sulphur dioxide or sulphites and catalysts such as phenol compounds and iron salts. As an example, sulphur vapour or sulphuretted hydrogen may be treated with steam and oxygen or air in the presence of catalysts such as metals or oxides of the iron group, palladium, osmium, and platinum. The hydrogen and nitrogen may be used for the synthesis of ammonia or other nitrogenous products for the manufacture of fertilisers. Waste cellulose liquor may be treated with ammonia and sulphur dioxide and the precipitate treated with steam and lime, baryta or the like to remove ammonia. The product is a tanning agent. The liquor may be mixed with other fertilisers such as phosphates and calcium cyanamide. If the cellulose liquor is heated under pressure with sulphur dioxide, the product contains sulphates instead of sulphites.

Specifications Accepted, with Date of Application

174,360, 176,329. Liquid fuels for use in internal combustion engines and other purposes, Process for the manufacture of. F. Hostertler. January 14 and March 1, 1921. 176,329. Addition to 174,360.

174,642–3. Liquid hydrocarbons, Process of oxidising. H. Wintern-itz, T. Bullinger, and G. Teichner. January 29, 1921. 174,643 addition to 174,642.

177,177. Wood, Continuous distillation of. R. Porte. March 19, 1921.

182,084. 2-oxy-1-aryl-naphthylamines, Manufacture of. Soc. Anon. des Matières Colorantes et Produits Chimiques de Saint-Denis, A. R. Wahl, and R. Lantz. June 18, 1921.

182,459. Artificial resins, Process for improving. Consortium für Elektro-chemische Industrie Ges. June 29, 1921.

184,778. Acetylene, Process for purifying. Elektrizitätswerk Lonza. August 18, 1921.

187,579. Portland cement and the like, Manufacture of. Bühler, Geb. October 15, 1921.

196,306. Hydrocarbon oils, Process of and means for distilling and fractionating. E. H. French. October 17, 1921.

196,334. Electrolytic iron. F. A. Eustis. December 22, 1921.

196,357. Fixed atmospheric nitrogen, Recovery of. T. Twynam. January 19, 1922.

196,399. Coal tar, Dehydration of. S. W. A. Wikner and Newcastle-on-Tyne and Gateshead Gas Co. January 27, 1922.

196,431. Aurin tricarboxylic acid, Organic mercury derivatives of —and their alkali salts. M. E. Wolvekamp. February 14, 1922.

196,513. Horizontal and inclined retorts for the distillation of coal and like carbonaceous substances. C. P. Tooley and G. W. Tooley. June 15, 1922.

195,518. Radio-active plastic compositions from cellon, celluloid and the like. Process for the manufacture of. E. Seyfferth, Rheinisch-Westfalische Sprengstoff Akt.-Ges. Abteilurg Nürnberg vorm. H. Utendoerffer. June 28, 1922.

Applications for Patents

Borchers, W., and Stimson, R. W. Process for refining crude chromium alloys. 11082. April 24.

Bull, E. Bagnall-. Insecticides, sheep dips, etc. 10342. April 16.

Cassella and Co., Ges. L., and Ransford, R. B. Manufacture of alkyloxyacridines. 11900. May 2.

Cassella and Co., Ges., L. Manufacture of p-dialkylamino aryl-phosphinous acids. 11971. May 3.

Chemische Fabrik Aspe. Treatment of vegetable and animal oils. 10884. April 21. (Germany, April 22, 1922.)

Chemische Fabrik Griesheim-Elektron. Method of casting oxidisable metals. 12091. May 4.

Crozier, R. H., and Fairweather, D. K. Fractional distillation of oils from shale, etc. 10526. April 18.

Damard Lacquer Co., Ltd., and Potter, H. V. Phenolaldehyde condensation products. 11849. May 2.

Imray, O. Y., and Soc. of Chemical Industry in Basle. Manufacture of vat dye-stuffs from anthraquinone. 11617. April 30.

Johnson and Sons, Manufacturing Chemists, Ltd. Thermometer stand. 12017. May 4.

Plauson's (Parent Co.), Ltd. Process for purifying minerals. 11912. May 3.

Soc. l'Oxhydrique Française. Manufacture of hydrogen. 11651. April 30. (France, June 17, '22.)

Spence and Sons, Ltd., P. Removal of iron oxides from iron, etc., surfaces. 11348. April 27.

Vains, A. R. de. Process for neutralising the hydrochloric acid and dissolving the organic chlorides formed by chlorination of cellulose materials. 11639. April 30. (France, May 3, 1922.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to* THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

London, May 10, 1923.

THERE has been rather an improvement in the demand for chemicals generally during the past week, and the turnover is better than has been the case since Easter. Prices generally are inclined to advance.

Germany as a supplier has practically disappeared from the market, and Continental prices, almost without exception, are upon the level ruling here.

The export market is without special feature.

General Chemicals

ACETONE is in active demand. There have been one or two cheaper second-hand parcels about, and the market has been affected to a minor extent by forced realisations.

ACID ACETIC is higher in price and in short supply.

ACID CITRIC is a very firm market, and a satisfactory turnover is reported.

ACID FORMIC is in short supply, and with any improvement in business the price would probably jump to a much higher level.

ACID OXALIC in better request, price unchanged.

ACID TARTARIC is a firm and rising market and higher values are expected.

ARSENIC unchanged.

BARIUM CHLORIDE a little weak and demand is slow.

CREAM OF TARTAR is higher in price and demand is active.

FORMALDEHYDE is dearer and very scarce.

LEAD ACETATE has advanced and demand is better.

BROWN LEAD ACETATE remains scarce and in general inquiry.

LITHOPONE unchanged.

METHYL ALCOHOL remains a firm market.

POTASSIUM CARBONATE unchanged.

POTASSIUM CAUSTIC unchanged.

POTASSIUM PERMANGANATE is a slow market, price unchanged.

POTASSIUM PRUSSIATE poor demand, price inclined to be easier.

SODIUM ACETATE is very firm and scarce.

SODIUM BICHROMATE is in good demand. Price of foreign makers is dearer.

SODIUM HYPOSULPHITE.—Unchanged.

SODIUM NITRITE.—Unchanged.

SODIUM PHOSPHATE.—Unchanged.

SODIUM PRUSSIATE continues to sag in absence of business.

ZINC OXIDE.—Unchanged.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID is in steady demand, price unchanged.

ACETANILID is a firm market, slightly higher prices are being asked in some quarters.

ACID LACTIC is in more plentiful supply, the carboy lots offering below last week's level.

BARBITONE is still difficult to find—holders command the market.

HEXAMINE is steady, lower prices being accepted for spot. The forward position appears firm.

MILK SUGAR easier, dealers on the Continent having cut the price somewhat, doubtless due to the movement in the exchange.

PHENACETIN.—In steady demand. Powder is scarce and dearer.

SULPHONAL is dearer.

VANILLIN.—English makers command the situation and appear to undersell the Continental suppliers, who find it increasingly difficult to effect sales after payment of import duty.

Coal Tar Intermediates

There is no material change to report in the situation, but inquiry continues to be quite decent both on home and export account.

ALPHA NAPHTHOL.—Some export business is in the market, and the price is very firm.

ALPHA NAPHTHYLAMINE has been the object of some interest.

ANILINE OIL continues to pass regularly into consumption.

BENZIDINE BASE.—Foreign buyers are interested.

BETA NAPHTHOL.—Some home trade is reported.

DIMETHYLANILINE is without special feature.

DINITROCHLORBENZOL has been inquired for.

DIPHENYLAMINE is steady.

"H" ACID.—Some business is reported.

METANITRANILINE.—Some small trade has been done.

NAPHTHIONIC ACID is firm and in good demand.

ORTHO TOLUIDINE.—Some small home business.

PARANITRANILINE has been the object of some good inquiries.

PHTHALIC ANHYDRIDE.—Export inquiry good, and some home business is reported.

Coal Tar Products

The strong demand for some coal tar products is not quite so apparent as it was. Possibly this is due to the present high level of prices, which usually has the effect of limiting business.

90% BENZOL remains steady at 1s. 7d. per gallon on rails.

PURE BENZOL is also unchanged at 2s. 1d. per gallon on rails in the North, and 2s. 4d. to 2s. 5d. per gallon in the South.

CREOSOTE OIL is in less demand, and is worth about 8¼d. to 8½d. per gallon in the North, while the price in the South is about 9d. per gallon.

CRESYLIC ACID has no great inquiry, and is worth 2s. 2d. per gallon on rails for the pale quality, 95/99%, while the dark quality, 95/97% is worth about 1s. 10d. to 1s. 11d. per gallon.

SOLVENT NAPHTHA is very quiet, and is worth about 1s. 4d. per gallon on rails.

HEAVY NAPHTHA.—There is little business passing for this product, the price being quoted at 1s. 4d. per gallon on rails.

NAPHTHALENES are slightly easier, the better qualities being worth £13 10s. to £14 per ton, while the lower melting points are worth from £8 10s. to £10 per ton.

PITCH is dull, and prices have a downward tendency. Business for this season is practically at an end, and transactions for next season are still difficult to arrange. To-day's quotations are: 165s. to 175s. per ton, f.o.b., London; 160s. to 165s. per ton, f.o.b., East and West Coast ports.

Sulphate of Ammonia

Continental buyers are beginning to show some interest for autumn shipment, but are only prepared to offer comparatively low prices, and consequently transactions are scarce.

[Current Market Prices on following pages.]

The Chile Nitrate Market

MESSRS. HENRY BATH AND SON, LTD., in their monthly report on nitrate of soda, dated April 30, say:—

Deliveries of nitrate of soda from European ports during April are estimated at 194,000 tons, which compare favourable with 124,000 tons a year ago, and more than restore the adverse balance in March.

Despite the satisfactory nature of these figures, the value of nitrate for near arrival has consistently declined, and stands to-day no higher than about £12 2s. 6d. per ton c.i.f., at which price several transactions have recently been reported. July-August shipment by steam is valued at £11 12s. 6d. to £11 17s. 6d. c.i.f., according to destination.

Sales f.a.s. Chile by the Nitrate Producers' Association during April were about 30,000 tons, bringing the total to date for the current year to 1,960,000 tons, which quantity includes 260,000 tons for delivery during the second half of June. The exports from Chile during July, 1922–April, 1923, are estimated at about 1,900,000 tons, and supposing that this quantity, together with the stocks of over 300,000 tons, which existed outside Chile at July 1, 1922, are entirely consumed by the end of June, the world's consumption for the current nitrate year will reach about 2,200,000 tons.

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	7	to	0	1	9
Acetone oil	ton	90	0	0	to	95	0	0
Acetone, pure	ton	121	0	0	to	125	0	0
Acid, Acetic, glacial, 99–100%	ton	69	0	0	to	70	0	0
Acetic, 80% pure	ton	50	0	0	to	51	0	0
Acetic, 40% pure	ton	25	0	0	to	26	0	0
Arsenic, liquid, 2000 s.g.	ton	100	0	0	to	105	0	0
Boric, commercial	ton	50	0	0	to	55	0	0
Carbolic, cryst. 39–40%	lb.	0	1	8	to	0	1	9
Citric	lb.	0	1	10	to	0	1	10½
Formic, 80%	ton	52	10	0	to	53	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol	ton	41	0	0	to	43	0	0
Lactic, 60 vol	ton	43	0	0	to	44	0	0
Nitric, 80 Tw	ton	27	0	0	to	28	0	0
Oxalic	lb.	0	0	6½	to	0	0	6¾
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, Technical	lb.	0	1	9	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	5	to	0	1	5½
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	lb.	0	0	4	to	0	0	4½
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	35	0	0	to	37	10	0
Nitrate (pure)	ton	35	0	0	to	40	0	0
Phosphate	ton	68	0	0	to	70	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate	ton	175	0	0	to	185	0	0
Arsenic, white powdered	ton	75	0	0	to	78	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	17	0	0	to	17	10	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	1
Bleaching powder, 35–37%	ton	10	10	0	to	11	0	0
Borax crystals	ton	28	0	0	to	32	0	0
Calcium acetate, Brown	ton	11	10	0	to	12	0	0
Grey	ton	19	15	0	to	20	0	0
Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	0	0	to	7	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	100	0	0	to	105	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	27	0	0	to	28	0	0
Cream Tartar, 98–100%	ton	97	10	0	to	100	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	92	10	0	to	95	0	0
Formusol (Rongalite)	lb.	0	2	1	to	0	2	2
Glauber slats, commercial	ton	5	0	0	to	5	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols	gal	0	2	2	to	0	2	3
Iron perchloride	ton	28	0	0	to	30	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	43	0	0	to	45	0	0
Carbonate (White Lead)	ton	45	0	0	to	48	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	45	0	0	to	46	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	5	10	0	to	6	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	6	10	0	to	7	0	0
Sulphate (Druggists')	ton	10	0	0	to	11	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	58	0	0	to	60	0	0
Methyl acetone	ton	78	0	0	to	80	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	41	0	0	to	42	0	0
Ammonium sulphate, double salt	ton	41	0	0	to	42	0	0
Potash, Caustic	ton	35	0	0	to	36	0	0
Potassium bichromate	lb.	0	0	5¾	to	0	0	6
Carbonate, 90%	ton	31	0	0	to	32	0	0
Chloride, 80%	ton	9	10	0	to	10	10	0
Chlorate	lb.	0	0	4½	to	0	0	4½
Metabisulphite, 50–52%	ton	80	0	0	to	85	0	0
Nitrate, refined	ton	43	0	0	to	45	0	0
Permanganate	lb.	0	0	10½	to	0	0	11
Prussiate, red	lb.	0	4	3	to	0	4	4
Prussiate, yellow	lb.	0	1	4½	to	0	1	5
Sulphate, 90%	ton	10	10	0	to	11	0	0
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	24	15	0	to	25	0	0
Arsenate, 45%	ton	48	0	0	to	50	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4¾
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3½	to	0	0	3¾
Caustic, 70%	ton	19	10	0	to	20	0	0
Caustic, 76%	ton	20	10	0	to	21	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	28	0	0	to	29	0	0
Phosphate, crystal	ton	16	10	0	to	17	0	0
Perborate	lb.	0	1	0	to	0	1	1
Prussiate	lb.	0	0	8	to	0	0	8½
Sulphide, crystals	ton	10	10	0	to	11	0	0
Sulphide, solid, 60–62 %	ton	16	10	0	to	17	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	40	0	0	to	42	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	10	0	to	12	10	0
Roll	ton	11	0	0	to	12	0	0
Tartar emetic	lb.	0	1	2	to	0	1	3
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	40	0	0	to	42	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	16	0	0	to	17	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	3	to	0	3	6
Acetanilid	lb.	0	1	6	to	0	1	9
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	6	to	0	3	0
Salicylic, B.P.	lb.	0	2	2	to	0	2	6
Tannic, leviss	lb.	0	3	4	to	0	3	6
Amidol	lb.	0	8	3	to	0	8	6
Amidopyrin	lb.	0	13	3	to	0	13	6
Ammon ichthosulphonate	lb	0	2	0	to	0	2	3
Barbitone	lb.	0	18	6	to	0	19	6
Beta naphthol resublimed	lb	0	1	9	to	0	2	0
Bromide of ammonia	lb	0	0	9	to	0	0	10
Potash	lb.	0	0	8½	to	0	0	9
Soda	lb.	0	0	9	to	0	0	9½
Caffeine, pure	lb.	0	12	0	to	0	12	3
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0
Lactate	lb.	0	2	0	to	0	2	3
Calomel	lb.	0	4	9	to	0	5	0
Chloral hydrate	lb.	0	3	10½	to	0	4	0
Cocaine alkaloid	oz.	0	18	0	to	0	18	6
Hydrochloride	oz.	0	14	9	to	0	15	0
Corrosive sublimate	lb.	0	4	3	to	0	4	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	1	6	to	0	1	6½
B.P. (75–80% eucalyptol)	lb.	0	1	7	to	0	1	7½
Guaiacol carbonate	lb.	0	8	6	to	0	8	9
Liquid	lb.	0	9	6	to	0	10	0
Pure crystals	lb.	0	10	3	to	0	10	6
Hexamine	lb.	0	4	2	to	0	4	4
Hydroquinone	lb.	0	3	6	to	0	3	9
Lanoline anhydrous	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo	lb.	0	18	6	to	1	0	0
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	6	to	0	2	10
Metol	lb.	0	10	6	to	0	11	6
Milk sugar	cwt.	4	10	0	to	4	12	6
Paraldehyde	lb.	0	1	6	to	0	1	9
Phenacetin	lb.	0	6	3	to	0	6	9
Phenazone	lb.	0	7	9	to	0	8	0
Phenolphthalein	lb.	0	5	6	to	0	5	9
Potassium sulpho guaiacolate	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.	oz.	0	2	3			—	

	Per	£	s.	d.		£	s.	d.
Resorcine, medicinal	lb.	0	5	6	to	0	5	9
Salicylate of soda powder	lb.	0	2	6	to	0	2	9
Crystals	lb.	0	2	9	to	0	3	0
Salol	lb.	0	2	9	to	0	3	0
Soda Benzoate	lb.	0	2	3	to	0	2	6
Sulphonal	lb.	0	14	6	to	0	15	0
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	12	0	to	0	12	6
Soda salicylate	lb.	0	7	9	to	0	8	3
Vanillin	lb.	1	3	6	to	1	4	6

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9½	to	0	0	10
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	0	to	0	3	3
Benzidine, base	lb.	0	5	0	to	0	5	3
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Croceine Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	7	to	0	1	9
Dimethylaniline	lb.	0	3	0	to	0	3	3
Diphenylamine	lb.	0	3	9	to	0	4	0
H-Acid	lb.	0	5	0	to	0	5	3
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	2	3	to	0	2	6
Naphthionate of Soda	lb.	0	2	6	to	0	2	9
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevill Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	8	to	0	0	8
Nitronaphthalene	lb.	0	1	0	to	0	1	1
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	9	to	0	6	3
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.		£	s.	d.
Anise	c.i.f. 1/10 spot	0	2	0
Bay		0	12	0
Bergamot		0	12	0
Cajaput		0	3	9
Camphor, white	per cwt.	4	0	0
Brown	„	3	15	0
Cassia	c.i.f. 7/9 spot	0	8	3
Cedarwood		0	1	6
Citronella (Ceylon)	quiet but very firm	0	3	2
(Java)	„ „ „	0	4	0
Clove		0	7	6
Eucalyptus		0	1	6
Geranium Bourbon	higher and very firm	1	10	0
Lavender	scarce and very firm	0	12	6
Lavender spike		0	3	0
Lemon		0	3	0
Lemongrass	per oz.	0	0	2¼
Lime (distilled)		0	3	3
Orange sweet (Sicilian)		0	11	0
(West Indian)		0	10	0
Palmarosa	very firm	0	17	6
Peppermint (American)		0	13	0
Mint (dementholised Japanese)	harder	0	6	3
Patchouli		1	12	0
Otto of Rose	per oz.	1	6	0
Rosemary		0	1	8
Sandalwood		1	6	0
Sassafras		0	5	0
Thyme	according to quality 2/6 to	0	8	0

Synthetics.			
Benzyl acetate	0	3	0
Benzoate	0	3	0
Citral	0	10	0
Coumarine	0	15	0
Heliotropine	0	7	0
Ionone	1	5	0
Linalyl acetate	1	2	6
Methyl salicylate	0	2	6
Musk xylol	0	9	0
Terpeniol	0	3	1

Market for Soap in Dominican Republic

H.M. Consul at Santo Domingo (Mr. Darrell Wilson) reports that there is a possible market in the Dominican Republic for British household and laundry soaps. The Consul, in describing local market conditions, states that soap is sold there in bars of 7 oz. and 8 oz. packed in cases which usually contain 200 bars, 192 bars or 125 bars. It is also sold in cakes of 14 oz., 8 oz., and 7 oz. The cases usually contain 100 cakes. The brands which have the largest sale in the market are the following:—"Martillo" of Armour and Co., packed 100 cakes to the case, each cake weighing 8 oz. This soap is sold c.i.f. Santo Domingo at $4.50 per case and is retailed at $5.75 per case. "Colibri," of Fairbanks and Co., packed 200 bars to the case, each bar weighing 8 oz. This soap was sold in New York, f.o.b. at $7.25, but the price is understood to have risen to $7.50. It is retailed in Santo Domingo at $9.75 and $10 per case. "La Bandera," of Lightfoot Schultz Co., packed 125 bars to the case which weighs 87½ lbs. It is sold for $7.25 per 100 lbs. f.o.b. New York and retailed in Santo Domingo at $8.75 per case of 87½ lbs.

The import duty is $2.75 per 100 kilos gross. Imports of soap into the Dominican Republic were as follows:—

		Kilos.	Value.
1920.	Total	2,587.519	$701,485
	British.. ..	1,193	$ 472
1921.	Total	1,644,134	$301,939
	British ..	201	$ 55

The above information will doubtless enable British firms to ascertain whether it is possible to sell their soaps in Santo Domingo. If so, it is suggested that they should furnish His Majesty's Consul with full particulars, prices, etc., with a view to obtaining the name of a likely agent in that market. Communications should be addressed formally as follows: His Majesty's Consul, British Legation, Santo Domingo, Dominican Republic. His Majesty's Consul adds that it is most desirable to assist such an agent in promoting an advertising campaign. The Department of Overseas Trade should also be notified if any action is taken in regard to this matter.

Nitrate Prices for the Future

At a meeting held in Valparaiso on May 3, the directorate of the Association of Chilean Nitrate Producers unanimously fixed the following prices per metric quintal (of 100 kilos):—

	s.	d.		s.	d.
July	19	3	First half of Nov. ..	20	5
First half of Aug. ..	19	5	Second half of Nov. ..	20	7
Second half of Aug. ..	19	7	First half of Dec. ..	20	9
First half of Sept. ..	19	9	Second half of Dec. ..	20	11
Second half of Sept. ..	19	11	January 1 to June 15 ..	21	0
First half of Oct. ..	20	1	Second half of June ..	19	3
Second half of Oct. ..	20	3			

The directorate also decided that no sales are to be effected for delivery beyond January 10; that from July 1 delivery of all sales to be effected from fixed dates as follows:—1st, 8th, 16th and 23rd of each month; and that sales at the new scale are to commence from Monday next.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, May 8, 1923.

BUSINESS during the past week has been quiet with only a moderate number of inquiries, mostly for export.

Prices are well maintained, spot lots of Continental products firmer if anything.

Industrial Chemicals

ACID ACETIC.—Glacial, 98/100%, £62 to £68 per ton; 80% pure, £47 to £48 per ton; 80% technical, £45 to £47 per ton, c.i.f. U.K., duty free.

CID BORACIC.—Makers advise reduction of £5 per ton; crystal or granulated, £50 per ton; powdered, £52 per ton, carriage paid U.K. stations.

ACID CARBOLIC (Ice Crystals).—Now quoted 1s. 6d. per lb.

ACID CITRIC.—Moderate inquiry. Quoted 1s. 10d. per lb., spot or forward delivery.

ACID FORMIC, 80%.—Cheaper quotations at about £52 per ton, ex works.

ACID HYDROCHLORIC.—Unchanged at 6s. 6d. per carboy, ex works.

ACID NITRIC, 84°.—£27 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Unchanged at about 6½d. per lb.

ACID SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full truck loads. De-arsenicated quality, £1 per ton, extra.

ACID TARTARIC.—Unchanged at 1s. 2½d. per lb.

ALUM, LUMP POTASH.—Quoted £11 10s. per ton, f.o.b. for export. Spot lots about £12 15s. per ton.

ALUMINA, SULPHATE.—17/18%, on offer at £10 per ton, ex store.

AMMONIA, ANHYDROUS.—Remains unchanged at 1s. 6d. per lb., ex station.

AMMONIA, CARBONATE.—Lump, 4d. per lb.; ground, 4¼d. per lb., delivered.

AMMONIA, LIQUID, 880°.—In little demand; 3½d. per lb. delivered, drums extra.

AMMONIA, MURIATE.—Grey galvanizers quality about £33 to £34 per ton, f.o.r. works.

AMMONIA, SULPHATE.—25¼%, £15 10s. per ton; 25¾% neutral, £16 13s. per ton, ex works, May delivery.

ARSENIC, WHITE POWDERED.—In good demand and inclined to be higher at £77 per ton, ex store.

BARIUM CARBONATE.—98/100%, precipitated, quoted £16 per ton, ex stations.

BARIUM CHLORIDE 98/100%.—English material offered at £17 10s. per ton, ex store.

BARYTES.—Finest white English, unchanged, at £5 5s. per ton, ex works.

BLEACHING POWDER.—Now £11 7s. 6d. per ton, ex station, spot delivery. Contracts 20s. per ton less.

BORAX.—Unchanged crystal or granulated, £28 per ton; powdered £29 per ton, carriage paid U.K.

CALCIUM CHLORIDE.—English material £5 12s. 6d. per ton, ex quay or station. Continental offered at £5 per ton, c.i.f. U.K.

COPPERAS, GREEN.—Moderate export inquiry. Quoted £2 10s. per ton, f.o.b. U.K.

FORMALDEHYDE 40%.—Firmer at about £88 per ton, ex wharf.

GLAUBER SALTS.—Finest white crystals, £3 17s. 6d. per ton, ex store.

LEAD, RED.—English make £41 per ton, carriage paid U.K. Continental about £36 per ton, ex store.

LEAD ACETATE.—White crystals, unchanged at about £41 per ton, ex store.

MAGNESITE, GROUND CALCINED.—£8 10s. per ton, ex stations.

MAGNESIUM CHLORIDE.—Offered from Continent at £2 17s. 6d. per ton, c.i.f. U.K. Spot lots about £4 5s. per ton, ex store.

MAGNESIUM SULPHATE (Epsom Salts).—Commercial £7 per ton; B.P. crystals £8 10s. per ton, delivered. B.P. for export £6 10s. f.o.b. U.K.

POTASH, CAUSTIC, 88/92%.—On offer at £34 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb. delivered.

POTASSIUM CARBONATE.—96/98% about £34 per ton; 90/92% £29 per ton, ex store, spot delivery.

POTASSIUM CHLORATE.—Unchanged at 3d. per lb.

POTASSIUM NITRATE.—In little demand. Price about £32 per ton, ex store.

POTASSIUM PERMANGANATE.—Commercial 10¼d. per lb.; B.P. crystals 11½d. per lb. ex store.

POTASSIUM PRUSSIATE (YELLOW).—Now quoted 1s. 4¾d. per lb. ex store.

SODA, CAUSTIC.—76/77%, £21 7s. 6d. per ton; 70/72%, £19 17s. 6d. per ton; 60/62%, broken, £21 2s. 6d. per ton; 98/99%, powdered, £24 15s. per ton, ex station.

SODIUM ACETATE.—Unchanged at about £25 10s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station; mineral water quality, 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb. delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station, spot delivery. Alkali, 58%, £8 17s. 6d. per ton, ex quay or station, spot delivery.

SODIUM CHLORATE.—On offer at 2¾d. per lb., ex store.

SODIUM HYPOSULPHITE.—Commercial crystals, £10 10s. per ton; pea crystals, £15 10s. per ton, ex station.

SODIUM NITRATE.—Refined, 96/98%, £13 10s. per ton, f.o.r. or f.o.b. U.K.

SODIUM NITRITE, 100%.—£27 to £29 per ton, according to quantity.

SODIUM PRUSSIATE (Yellow).—Now offered at 8d. per lb., ex store.

SODIUM SULPHATE (Saltcake 95%).—Home price £4 per ton, carriage paid station. Good export inquiry.

SODIUM SULPHIDE.—60/62% solid, about £15 10s. per ton; 60/62%, broken, £16 10s. per ton.

SULPHUR, Flowers, £10 per ton; Roll, £9 per ton; Rock, £9 per ton; Ground, £8 per ton; prices nominal.

TIN CRYSTALS.—Now quoted 1s. 4d. per lb.

ZINC SULPHATE.—White commercial, £14 per ton.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANILINE OIL.—Price firm at 10d. per lb. in returnable drums.

ANILINE SALT.—Price 10d. per lb. delivered, casks included.

BENZIDINE BASE.—In strong demand. Price quoted, 16s. 6d. per lb. 100% basis.

CASSELLA F ACID.—Home inquiry. Price quoted, 10s. per lb. 100% basis, carriage paid.

DICHLORANILINE.—Home inquiry. Price quoted, 2s. 2d. per lb. delivered.

DICHLORANILINE SULPHONIC ACID.—Supplies offered at 2s. 11d. per lb. delivered.

GAMMA ACID.—Home inquiry. Price quoted, 13s. 9d. per lb. 100% basis.

META TOLULENE DIAMINE.—Good demand for export. Price quoted 5s. per lb. f.o.b.

MONO NITRONAPHTHALINE.—Export inquiry. Price quoted, 1s. per lb. f.o.b.

NITROBENZOL is offered at 8d. per lb. delivered, drums returnable.

PARAPHENYLENEDIAMINE.—Export inquiry. Price quoted, 12s. 6d. per lb. f.o.b.

French Potash

CONSEQUENT on the close of the spring fertiliser season, the volume of trade in French potash salts has decreased during the past week, and at present little is being done on an immediate delivery basis. Requests for quotations for later delivery however, indicate that a fair trade in the lower grades is to be expected. Sales of sulphate and muriate do not appear likely to show greater activity in the near future, and compared with last year the turnover for these grades has been less satisfactory. Trade abroad, especially in America, remains satisfactory, and ample supplies of all grades of potash salts are available.—*French Potash Mines Bureau.*

Manchester Chemical Market

[From our own Correspondent.]

Manchester, May 10, 1923.

Buyers of chemicals are taking fair quantities both for home consumption and for shipment, and a brighter tone has been in evidence on the chemical market here during the last few days. Here and there there has been a slight shading of prices, but only a very few lines have been affected in this respect, quotations generally ruling very firm. On the Manchester Stock Exchange this week "chemicals" have continued to command active support.

Heavy Chemicals

Caustic soda shows no change either in position or value, the demand for home trade users and for export being maintained at a satisfactory level at from £19 for 60 per cent. to £21 10s. per ton for 76–77 per cent. material. Bleaching powder is likewise in good inquiry for both branches of trade, and the price to home consumers keeps firm at the recent reduction to £11 7s. 6d. per ton. Soda crystals are meeting with a readier sale at £5 5s. per ton delivered. Salt-cake is in steady demand for home users, and good business is being done on export account; the price for the former is unchanged at £4 10s. per ton. Sodium sulphide is still inactive at £15 per ton for 60–65 per cent. concentrated solid and £9 for crystals. Glauber salts are in better demand at £4 per ton. Bicarbonate of soda is firm at £10 10s. per ton delivered to home users, a fair amount of business being put through. Alkali keeps very active both on home and foreign account; the price for 58 per cent. material is firm at £7 12s. 6d. per ton to home users. Hyposulphite of soda is quiet but steady at £15 per ton for photographic crystals, and £10 for commercial. Nitrite of soda is inactive at £26 10s. per ton. Phosphate of soda is firm at £15 per ton, but the demand for this product is restricted. Chlorate of soda is in good inquiry at 2⅞d. to 3d. per lb. Prussiate of soda is still quiet and slightly easier at about 8d. per lb. Bichromate of soda is in good request, and price is steady at 4½d. per lb. Acetate of soda is unchanged at £24 per ton, but no improvement can be reported.

Caustic potash is firm and in steady demand at £34 per ton for 88–90 per cent. Carbonate of potash also is very active at £33 per ton for 96–98 per cent. material, and £28 10s. for 88–92 per cent. Bichromate of potash is being steadily inquired for at 5¾d. per lb. The demand for yellow prussiate of potash shows little or no improvement, though the price is fairly steady at 1s. 5d. per lb. Chlorate of potash is being taken up in fair quantities at 3½d. per lb. Supplies of permanganate of potash are rather less restricted, and the price is a shade easier at 9¾d. per lb.

Sulphate of copper is still in fair demand for export, and price is firm at £26 10s. per ton, f.o.b. Arsenic is still in short supply, and current quotations are unchanged at £75 per ton for white powdered, Cornish makes, export inquiry keeping up though home consumption is rather quiet. Commercial Epsom salts are going steadily into consumption at £5 10s. per ton, with magnesium sulphate, B.P., on offer at £7. Acetate of lime is still scarce, and prices are very firm at £20 for grey and £10 10s. per ton for brown. Nitrate of lead is slightly less active at £43 to £43 10s. per ton. White sugar of lead is firmly maintained at £44 per ton, with brown at £41 to £42.

Acids and Tar Products

Tartaric acid is in good demand and very firm at 1s. 3½d. to 1s. 4d. per lb. Citric acid, B.P. crystals, is also dearer at 1s. 10d. on sustained inquiry. Acetic acid is fairly steady at round £70 for glacial and £47 per ton for 80 per cent. technical, though the demand is said to have eased off. Oxalic acid continues quiet at about 6½d. per lb.

Among coal-tar products, pitch is now quoted at round £7 per ton, the export inquiry having fallen off considerably. Carbolic acid crystals are quiet and easier at 1s. 5d. per lb., with crude, 60 per cent., quoted at about 3s. 6d. per gallon. Benzole is about unchanged at 1s. 8d. per gallon, but business is still on modest lines. Solvent naphtha is quiet and weaker at 1s. 8d. per gallon. Creosote oil is now quoted at 9¼d. to 9½d. per gallon, with a less active demand. Refined naphthalene keeps firm at £20 to £21 per ton and crude at from £6 to £13, a steady volume of business being put through.

Assessment Appeal by British Dyestuffs Corporation

In the King's Bench Division on Tuesday Mr. Justice Rowlatt heard an appeal by the British Dyestuffs Corporation (Blackley), Ltd., for a decision of the Inland Revenue Commissioners. The case raised the point whether certain payments by an American firm to the appellants were capital payments or income upon which excess profits duty could properly be levied.

Sir John Simon, K.C., for the appellants, said they were formerly known as Levensteins, Ltd., a dye manufacturing enterprise in the North of England. In 1916 they acquired a factory at Ellesmere Port for the manufacture of synthetic indigo and with it the secret process for manufacture. Subsequently appellants entered into an agreement with the Du Pont de Nemours Co., of America, by which each party undertook to communicate to the other their secret trade processes, and in return for the synthetic indigo manufacture process, the American company agreed to pay appellants £25,000 a year for ten years ending July, 1927. Counsel's submission was that that was a capital transaction—a transfer of capital assets on one side for a capital remuneration on the other. The revenue authorities had treated the payments as income on the business receipts and therefore included them in the appellants' profits for excess profits duty. Counsel contended that that was a wrong method for the Inland Revenue authorities to have adopted. This was clearly not profits, but a capital transaction and the conclusion of the authorities was therefore wrong.

Sir Ernest Pollock, K.C., supported the finding of the Inland Revenue Commissioners on behalf of the Crown.

His lordship dismissed the appeal. He said that upon the whole he thought the Crown was right, and the way they looked at the matter was the most natural and direct way. It was really using this property and taking an annual return for it which roughly corresponded to its average life and not a sale once and for all of a capital asset.

Bankruptcy of Oil Chemist

The affairs of George Edward Heyl, late of King's House, Kingsway, W.C., came before Mr. Registrar Hope at the London Bankruptcy Court on Friday, May 4, on the hearing of his application for an order of discharge. The debtor had been engaged in research work in connection with the production of oil, and was adjudged a bankrupt in March, 1918, with ranking liabilities which he estimated at £70,895. In his report on the application, the Official Receiver said that according to the trustee in the bankruptcy the total of the unsecured indebtedness would apparently amount to £50,407 18s. The assets, estimated to produce £300,120, had realised £18,576 15s. 8d., and dividends amounting to 6s. 6d. in the £ had been paid, and a further dividend amounting to 3d. or 4d. in the £ might be paid. Debtor was born in Berlin, and came to this country in 1894, where he was naturalised in 1898, and was employed as a chemist to a firm of electric cable makers until 1901. For several years afterwards he acted as a consulting engineer. In 1907 he was employed for two years as a chemist to a firm in Mexico, and upon his return to this country in 1909 he continued as a consulting engineer. In 1912 he took offices at King's House, Kingsway, and was engaged until 1916 in inventing different processes and research work in connection with the production of oil from British natural resources, upon which inventions (about 13 or 14) he spent considerable sums of money. His failure was due to alleged breaches of the agreement for the sale of his business to the Rapid Distillation and Power Co., Ltd. After hearing further arguments, the Registrar said he did not see his way to granting the discharge subject to a money judgment. He should impose a suspension for twelve months.

New Calcium Nitrate Plant

A message from Munich states that the Stickstoff A. G., which belongs to the Bayerische Stickstoffwerken A. G. of Munich and is an Austrian company working with German capital, is about to construct important works for the production of calcium nitrate at Gollingen. The company will utilise chalk from the neighbouring quarries, native peat coke and nitrogen from liquid air, and will obtain electric power from hydraulic forces which can be utilised in the region.

Company News

LIVERPOOL NITRATE CO.—An interim dividend of 1s. per share, less tax, is announced, payable on May 29.

CASTNER-KELLNER ALKALI CO.—An interim dividend of 8 per cent., actual, less tax, for the six months ending March last, is announced, payable on May 24.

CHLORIDE ELECTRICAL STORAGE.—The directors announce a final dividend of 5 per cent. actual, free of tax, on the ordinary shares, making 10 per cent. for the year, and a bonus of 5 per cent. actual, free of tax.

ROSARIO NITRATE CO.—A dividend for the fifteen months to December 31 last, at the rate of 10 per cent. (2s. per share), free of tax, is payable on May 25. For the preceding period of twelve months to September 30, 1921, a similar dividend was paid.

ENGLISH MARGARINE WORKS (1919).—The net profit for 1922 was £6,026, while £9,240 was brought in. After allowing £7,500 for depreciation and £7,367 for reserve for income-tax, a balance of £399 is carried forward. Meeting, Exchange Station Hotel, Liverpool, May 18, at 10.30 a.m.

NEW PACCHA AND JAZPAMPA NITRATE CO.—The report for 1922 shows a trading profit of £1,767, to which is added £4,264 brought forward. After deducting London charges there remains £4,452. The directors recommend a dividend of 5 per cent., leaving £1,017 to be carried forward.

BRUNNER, MOND AND CO., LTD.—The directors announce a further dividend of 7½ per cent., making 11 per cent. for the year, against 8 per cent. for the previous year. A sum of £225,000 is placed to suspense account; £62,000 is transferred to general reserve and £92,000 is carried forward, against £93,293 brought in.

TARAPACA AND TOCOPILLA NITRATE CO.—The net profit for 1922 was £14,644, which, with £86,772 brought in, makes a total of £101,416. The directors recommend a dividend of 10 per cent. on the old shares, less tax, and 5 per cent. on the new shares, less tax. A sum of £24,609 has been placed to reserve, and £54,683 is carried forward. Meeting, Winchester House, on May 22, at 12.30 p.m.

BOOTS PURE DRUG CO.—The trading profits for the year ended March 31 last, were £752,690, and, after meeting all charges, and adding £20,000 to the pension fund, the net profits were £595,811. The dividends absorbed £456,729, and £45,089 was written off goodwill, leaving a balance of £93,993. The undivided surplus was £1,443,071, of which £900,000 has been capitalised and distributed among the ordinary shareholders as bonus.

BRITISH COTTON AND WOOL DYERS' ASSOCIATION, LTD.—The annual report shows a net profit of £176,548, plus £23,000 brought forward. The directors propose a dividend of 10 per cent. and a cash bonus of 5 per cent., placing to reserve fund £50,000, to employees' benefit fund £20,000, and carrying forward £42,382. It is further proposed to capitalise part of the reserve fund of £225,000 and issue bonus shares in the proportion of one to every three shares held on May 16, the date of the annual meeting.

JURGENS, LTD.—The net profit for 1922 was £188,261, and £28,184 was brought in. After deducting the dividend on the 7 per cent. cumulating participating preference shares for the year, there remains £87,500 to be carried forward. The report states that from a trading point of view the year has been one of considerable difficulty, and the company has had to contend with severe and unwarranted competition, which affected selling prices. The turnover is stated to have developed satisfactorily.

ARIZONA COPPER CO.—The report, for the period from October 1 to March 31 shows that dividends on holdings in the Phelps Dodge Corporation amounted to £25,094 and £20,389 was brought in from the previous account. While the settlement of outstanding questions with the Revenue has not been concluded, the directors feel justified in transferring £50,000 from reserve, making £92,820. From this sum, the directors recommend a further dividend on the ordinary shares of 1s. per share, tax free, carrying forward £16,285.

BRITISH OIL AND CAKE MILLS.—The report for 1922 states that the company's position in regard to liability for excess profits duty, income tax, and corporation profits tax, has not yet been determined, but every effort is being made to bring these matters to a final settlement. Subject to adjustment of reserve for contingencies and provision of £10,000 for staff pension fund, there is a credit balance for the year of £295,872, and £25,418 was brought in, making £321,290. The preference share dividend absorbs £40,871, and the ordinary share dividend of 10 per cent. amounts to £254,140, leaving £26,280 to be carried forward. The annual meeting will be held at Winchester House, London, on May 24, at 12.30 p.m.

SALAR DEL CARMEN NITRATE SYNDICATE, LTD.—At the annual general meeting on Friday, May 4, Mr. H. W. Sillem (chairman of the company), in moving the adoption of the report and accounts, said that the net profit was £58,204, which, with £18,576 brought in from last account, made a total credit of profit and loss account of £76,780. The board recommended this sum should be dealt with as follows: (1) Provision for the interim dividend of 5 per cent., less tax paid in November last, £8,112; (2) the payment of a final dividend of 20 per cent., less tax, absorbing £32,450; (3) transfer to general reserve, £15,000; (4) depreciation of plant and machinery, £5,000; leaving to be carried forward £16,218. The board regarded the result of the year's working as satisfactory, and, in view of the substantial profit earned, coupled with the greatly improved outlook of the nitrate industry, they felt justified in recommending an increase of dividend on this occasion. For 1921 the distribution was 20 per cent., for 1922 it was 25 per cent.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. No.
New Zealand ..	Drugs, etc.	596
Italy	Zinc, copper, antimony, lead, etc.	605
Italy	Shellac, etc.	606
Sweden	Chemicals for the pulp and paper industry.	613
Sweden	Chemical products and dyestuffs for the wood pulp, paper and glass industries.	614
Washington ..	Asbestos and asbestos products.	18655/F.W./M.C./2.

Tariff Changes

FRENCH TOGOLAND.—The *Journal Officiel* (Paris) for April 22 contains a Presidential Decree which provides that the holding, circulation, and offering for sale of drugs, chemical and medicinal products and pharmaceutical and druggists' specialities is subject to the authorisation of the French Commissary. These articles may be imported for sale only on presentation of a request for permission to import, stating the exact name and origin of the product and the quantity proposed to be imported, and accompanied by a sample. All pharmaceutical specialities must show legibly on the envelope or label their exact qualitative or quantitative composition.

LITHUANIA.—A new customs tariff which has been introduced which provides for considerable reduction of import duties. Particulars of the rates payable on any goods or classes of goods on importation may be obtained on application to the Tariff Section of the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

URUGUAY.—A resolution recently passed provides that bicarbonate of soda of a strength of more than 98 per cent. is to be classed as "medicinal" under Tariff No. 194. Bicarbonate of soda of a strength of less than 98 per cent. is to be classed as "commercial" under Tariff No. 195. Bicarbonates in packets or cases, labelled "pure," may be imported provided they are of a strength of more than 98 per cent.

THE BRITISH ALIZARINE COMPANY LTD.

Manchester London Glasgow

Manufacturers of Alizarine Dyestuffs

ALIZARINE RED (all shades)

ALIZARINE BLUES (soluble and insoluble)

ALIZARINE BORDEAUX

ALIZARINE CYANINE

ALIZARINE GREEN (soluble and insoluble)

ALIZARINE ORANGE

ALIZARINE RED S. POWDER

ALIZARINE BLUE BLACK

ALIZARINE (MADDER) LAKES (of all qualities)

ALIZARINE MAROON

ALIZUROL GREEN (Viridine)

ANTHRACENE BROWN

ALIZANTHRENE BLUE

ALIZANTHRENE BROWN

ALIZANTHRENE YELLOW

Other fast colours of this series in course of preparation

Anthraquinone, Silver Salt and all intermediates of this series

---

CHROME TANNING and other Chrome Compounds

TELEPHONES
663 Trafford Park, MANCHESTER
560 EAST LONDON
5667 DOUGLAS, GLASGOW

TELEGRAMS:
BRITALIZ MANCHESTER
BRITALIZ LONDON
BRITALIZ GLASGOW

All communications should be addressed to
The British Alizarine Co., Ltd.
Trafford Park, Manchester

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

BRITISH PHARMACIES, LTD., 18, Chalton Street, N.W., chemists. (C.C., 12/5/23.) £26 1s. 2d. March 19.

CROUCH, Samuel (trading as AIRALITE NON EXPLOSIVE GAS CO.), 52, Little Britain, E.C. (C.C., 12/5/23.) £29 0s. 9d. March 21.

TREADGOLD, F., AND SONS, Abbey Road, Grimsby, dyers and cleaners. (C.C., 12/5/23.) £15 6s. 11d. March 21.

Receiverships

BRIGG'S PHARMACY STORES, LTD. (R., 12/5/23.) W. M. Lowick, of 16, Bridge Street, Bristol, was appointed receiver and manager on April 24, 1923, under powers contained in debentures dated April 15 and 16, 1922.

KERSHAW (ROBERT) (ROCHDALE), LTD. (R., 12/5/23.) E. C. Garnett, of Prudential Chambers, Rochdale, was appointed receiver and manager on April 19, 1923, under powers contained in debentures dated December 1st, 1922.

LOUBET AND CO., LTD. (R., 12/5/23.) S. A. Young, of 19, Coleman Street, E.C., was appointed receiver by Order of Court dated May 1, until May 4, 1923.

"ODDS ON" SPECIFICS CO., LTD. (R., 12/5/23.) A. W. Norton, of 265, Balham High Road, S.W., was appointed receiver on April 23, 1923, under powers contained in debentures dated November 24, 1922.

RAYMET AND CO., LTD. P. S. Booth, of 28, Kimberley House, Holborn Viaduct, E.C., ceased to act as receiver or manager on April 30, 1923.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

ALLEN AND LLOYD, LTD., Aldershot, chemists. (M., 12/5/23.) Registered April 26th, £500 2nd debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act 1908), present issue £250; general charge (subject to 1st debentures). *£4,500. April 14, 1922.

VEGETABLE OILS AND MARGARINE, LTD., London, E.C. (M., 12/5/23.) Registered April 25, £20,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act 1908), present issue £7,000; general charge.

Satisfactions

CLEAVER (F. S.), AND SONS, LTD., Twickenham, soap manufacturers. (M.S., 12/5/23.) Satisfaction registered April 27, £10,000, registered January 2, 1913.

GILBERT AND KNOWLES, LTD., London, E.C., chemical merchants. (M.S., 12/5/23.) Satisfaction registered April 26, £200, part of amount registered September 1, 1921.

MARLEY HILL CHEMICAL CO., LTD. (M.S., 12/5/23.) Satisfaction registered April 30, £3,000, part of amounts registered January 4 and March 21, 1921.

ROWE (T. B.) AND CO., LTD., Brentford, soap makers. (M.S., 12/5/23.) Satisfaction registered April 25, £1,500, part of amount registered February 20, 1906; and £1,000, part of amount registered February 8, 1913.

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Company Winding Up Voluntarily

WEARSIDE REFINING CO., LTD. (C.W.U.V., 12/5/23.) Thomas Floyd Hughes, Devonshire Road, Claughton, appointed liquidator. Meeting of creditors at Block C 1 and 2, Vittoria Wharf, Birkenhead, on Friday, May 11, at noon.

Notice of Intended Dividend

BOWMAN, Alexander, The Lowther Arcade, and 1, Rickergate, Carlisle, drug store proprietor. Last day for receiving proofs, May 23. Trustee, P. S. Booth, 2, Bixteth Street, Liverpool.

Bankruptcy Information

CALVERT, Jackson, "Wagaraw," Greenhead Road, Huddersfield, Yorks, manufacturing chemist. (R.O., 12/5/23.) Receiving order, May 5. Debtor's petition.

ROOKES, William Percy, 10, Station Hill, Eastleigh, Hants, chemist and druggist. (R.O., 12/5/23.) Receiving order, May 1. Debtor's petition.

YOUNG, James Albert, Mere Hall Grease Works, Bangor Street, Bolton, grease manufacturer. First meeting, May 15, 2.30 p.m., Official Receiver's Offices, Byrom Street, Manchester. Public examination, June 19, 10.45 a.m., Court House, Mawdsley Street, Bolton.

Partnerships Dissolved

THE ALBERT MILLS CO. (Thomas Taylor WALTON and Elizabeth JENKINS, Wife of Andrew Jenkins), paint, varnish, oils, etc., dealers, 80, Edleston Road, Crewe, by mutual consent as from January 1, 1923. Debts received and paid respectively by Elizabeth Jenkins, who will continue the business.

PERCY, DOUGLAS AND CO. (Douglas Frederic SCHIER-WATER and Alphonsus Percy FISHWICK), toilet requisite manufacturers, 21, Dale Street, Liverpool, by mutual consent as from February 28, 1923.

New Companies Registered

BRITISH CHEMISTS, LTD., 2, Ravenscourt Square, London, W.6. Wholesale and retail chemists, druggists, etc. Nominal capital, £500 in £1 shares.

CLEGG AND CO., LTD. Manufacturing chemists. Nominal capital, £4,000 in £1 shares. A director: J. W. Clegg, 18, Wesley Street, Castleford.

DUBARRY PERFUMERY CO., Goldstone Laboratories, Hove. Manufacturing wholesale, retail, consulting, and analytical chemists and druggists; soap manufacturers, smelters and refiners of ores, etc. Nominal capital, £150,000 in 100,000 7½ per cent. cumulative preference shares of £1, and 1,000,000 ordinary share of 1s.

HOSPITAL CONTRACTS CO., LTD., 27–35, Mortimer Street, London, W.1 Chemicals, druggists, analytical chemists dispensers, etc. Nominal capital, £300 in £1 shares.

LONDON PASTE CO., LTD., Arlington Street Works, New North Road, London. Manufacturers of pastes, gums, glues and other adhesives, etc. Nominal capital, £1,000 in £1 shares.

OIL DISTRIBUTORS (LIVERPOOL), LTD., 120, The Albany, Old Hall Street, Liverpool. Distributors, importers and exporters of and dealers in oils, fats, grease, spirits, spirit substitutes and by-products, etc. Nominal capital, £1,000 in £1 shares.

O'NEILL'S WATERPROOF PAINT AND COMPOSITIONS CO., LTD., 37, Railway Terrace, Hylton, near Sunderland. Manufacturers of waterproof paints and anti-fouling compositions, cement, lime, plasters, etc. Nominal capital, £2,000 in £1 shares.

ROUSSELOT ET CIE., LTD., 2A, Suffolk Lane, London, E.C. Importers, exporters, manufacturing and analytical chemists, perfumers, and manufacturers' agents. Nominal capital, £1,000 in £1 shares.

UNITY ENGINEERING AND CHEMICAL CO., LTD., 94, Market Street, Manchester. Chemical engineers and consultants. Nominal capital, £2,000 in £1 shares.

WEST SCIENTIFIC APPARATUS CO., LTD. Manufacturers of and dealers in scientific instruments and apparatus, etc. Nominal capital, £500 in £1 shares. A director: C. A. West, 2, Madeleine Mansions, 102A, High Street, Putney, S.W.15.